THE IRON TRADE REVIEW

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YEAR OF RECOVERY

ENDS WITH CONSERVATIVE CONTRACTING FOR FUTURE.

Ore Prices of Season of 1907 Established by Sales for 1910—More Furnaces on Lake Shore.

The year 1909 will long be remembered on account of the wonderful recovery from profound depression to great prosperity that took place without the violent fluctuations in prices which characterized other periods. The conservative policy generally maintained this year concerning the making of contracts for finished materials has been, and still is, an important factor in establishing the iron business on a sound foundation of prosperity. While improvement in business has been great in all parts of the country, especially impressive statements are made as to the progress which is being made by the west, where there has been a tremendous increase in the consumption of iron and steel products. The leading fabricator of structural steel in the west states that in Chicago alone building projects pending involve over 200,000 tons of steel and this large tonnage does not include requirements of railroads or ship builders. That the building of new blast furnaces on the shores of the great lakes is not to halt is shown by the announcement that the Rogers-Brown Iron Co. will build two new furnaces at Buffalo. The production of pig iron and steel by the United States Steel Corporation for December will be about the same as for November.

Iron Ore Prices

Following the selling of Bessemer ore at 50 cents' advance last week over the quotations that prevailed last year and the year before, sales of non-Bessemer ore were made by an important interest at an advance of 50 cents, and it is now regarded that this advance is established. Owing to the prevailing dullness in pig iron and the feeling of some furnace interests that the advance on non-Bessemer ores ought not to be as large as on the Bessemer, buying by the merchant furnace interests has not been carried on with the rush that followed the fixing of prices in November, 1906, when within ten days practically all ore available was sold. If, however, the expectation almost universally entertained that the new year will be one of great prosperity is realized, there will be no difficulty in disposing of the non-Bessemer grades at the advanced quotation. The iron ore on dock at lower lake ports Dec. 1 was 8,965,789 tons— the greatest amount on record.

Pig Iron is Dull

Although there is renewed interest in basic and low phosphorus iron in the Pittsburg district, and a fair inquiry in other sections, the pig iron market is dull in the north, but prices are pretty well maintained. In the south, the market is not only dull but there are unmistakable evidences of weakness. Softness in the pig iron market at this time of the year is not uncommon, and many observers look for marked improvement early in the new year.

Railroad Buying

Rail sales of the week amounted to 13,000 tons. The most important inquiries are 70,000 tons from the B. & O., 35,000 tons from Australia, and a good tonnage from Mexico. The Duluth, Missabe & Northern railroad has bought 1,500 ore cars from the Summers Steel Car Co., Pittsburg. The plates and shapes required, amounting to about 15,000 tons, will be supplied by the Carnegie Steel Co., as will also 12,000 steel wheels.

Finished Material

A new classification of wrought pipe has been announced by the National Tube Co., and adopted by the independent pipe makers. The sheet market is very active, and there is talk in the Chicago district of an advance by an independent interest. Corrugated sheets for mill construction are in heavy demand. A scarcity of crude steel is reported at Pittsburg and Chicago.

NEW CLASSIFICATION

On Wrought Pipe Adopted by Independents—New Iron Pipe Cards.

Pittsburg, Dec. 29. (By wire.)

Independent pipe makers have adopted the new classification on wrought pipe put out by the National Tube Co., effective Jan. 1, and are issuing revised cards. New cards have also been issued by the iron pipe makers, to which the sizes of 9, 10 and 12-inch have been added, upon which 54 off is allowed on black and 42 off on galvanized. In the adjustment an advance of 1 point or $2 a ton is made on the sizes of 7 to 12 inch which are now quotable at 67 off on black and 52 off on galvanized. In connection with the adoption of new card discounts some important revisions are made in the price lists on 8, 10 and 12-inch sizes in both iron and steel pipe.

RAIL SALES AND INQUIRIES.

New York, Dec. 29. (By wire.)

The United States Corporation's products for December will run about the same as November.

Rail sales of the Illinois Steel Co. total 13,000 tons, about half being to a Vanderbilt road. Export rail inquiry is large, including about 35,000 tons for Australia and a good tonnage for Mexico.

THE WEEK IN IRON CENTERS

PITTSBURG.

Satisfactory Conditions Predominate at Close of the Year.

Office of THE IRON TRADE REVIEW,
510 Park Building, Dec. 28.

The iron and steel industry is closing the year under very favorable circumstances. In practically all finished lines, the mills are operating at high tide gaits and their books are so filled with undelivered tonnage that it is assured present activities will be sustained for several months to come. The prospects for new and greater buying before the industry in the new year are pronounced to be very graitfying.

The only element of uncertainty in the situation is the probable effect upon the buying of certain products early in the new year, arising from the extremely heavy specifying against contracts expiring Jan. 1, which has continued up to the very last day. These contracts made at early dates at prices considerably under the present market level have uniformly been drawn against in full by customers and makers will have little opportunity for cancellation of unordered tonnage. There is plenty of evidence of a marked and widespread increase of consuming demand in the country and stocks are not thought to have accumulated abnormally, but there is much unshipped material still owing buyers by the mills under these engagements, which may hold temporarily within conservative limits new contracting at today's advanced prices. A slowing up in the heavy volume of business being entered would not be surprising to iron and steel makers nor would it be altogether unwelcome because of the congested condition of the mills, but from advance indications, it is believed this development, if it appears, will not be long-lived and that a new buying movement will be in evidence early in the first quarter.

Of all the finished lines, the condition of makers' books as to tonnage entered for 1910 is relatively the easiest in rails and this is applicable mainly to the eastern mills, as the western and southern plants are in very comfortable positions. This statement is further subject to the modification that the eastern rail makers will begin the year with a much greater tonnage booked for first half rolling than for the last half of the passing year and that a period of normal demand is anticipated, of which a considerable portion seems likely to be met by the increased capacity in the west and south.

A market development of importance in the week is the issuance of a reclassification of wrought pipe by the National Tube Co. Changes in both weights and price discounts are involved, so that net quotations remain unaltered.

Pig Iron.—The evidence of returning interest in basic by consumers is the leading development of the week in the pig iron market. While this grade has shown some improvement in sentiment for several weeks past after a long period of dullness and there has been a heavy transferring of iron from furnaces and middlemen to merchant interests to apply upon regular contracts, the inquiry of consuming buyers has been lacking. During the past week, several transactions of note have been put through, one steel company engaging approximately 10,000 tons for first half at $17.25, valley, while another melter bought from middlemen about 1,500 tons for first quarter, some of it at a reported price under $17, valley. Other users are sounding the market and further buying of note for first quarter and first half requirements is anticipated.

Quite a heavy speculative tonnage of basic has been held by middlemen and by private parties in this district and the low prices reported in the market are mainly attributed to this resale iron. Some furnaces have also shown aggressiveness in booking tonnage during the past month and prices of $17, valley, and under have been made in certain cases, but these transfers have usually been to stronger hands. A large tonnage now estimated at about 30,000 has figured in these transactions and most of it is not likely to come upon the market again. There is now pending in the market about about 10,000 tons of inquiry from middlemen for first half and second quarter and some sellers have asked up to $18, valley, for this latter delivery, while offers of $17.25, valley, for first half are reported to have been refused.

There is an active anticipation of forward shipments on Bessemer iron, but no new buying is being done. The price is holding firmly at $19, valley. Makers are expecting additional contracting in the first quarter if the present heavy melt of steel works is sustained. Foundry iron is extremely quiet, with consumers specifying freely on contracts and with frequent requests for advanced shipments. One sale of 600 tons of No. 2 for first half at $17.50, valley, is reported. Spot foundry continues about $17.25, valley, for No. 2, while $17 has lately been done.

The low phosphorus situation is rather spotted. Some makers of standard material in his territory continue to hold for $24, valley, which is above the local market, and some low selling is also reported. An eastern steel company has been inquiring for a block of 10,000 tons for first half.

On spot and first quarter shipment on northern iron, we quote as follows:

Bessemer, valley	$ 19.00
Bessemer, Pittsburg	19.90
No. 2 foundry, Pittsburg	18.15 to 18.40
Gray Forge, Pittsburg	17.15 to 17.40
Basic, valley	17.00 to 17.25
Basic, Pittsburg	17.90 to 18.15

Ferro-Alloys.—The increased railroad freight rates on ferro-alloys from seaboard points which will become effective Jan. 1 will bring the foreign and domestic tariffs to the same basis. Heretofore the inland rate on important material has been less than that on the domestic product. The market in ferro-alloys is exceedingly quiet with transactions being limited to carloads and small lots.

We quote ferro-manganese at $45 to $45.50, Baltimore, for immediate shipment or for first half, and from $45.50 to $46.50 for second half. The freight from Baltimore to Pittsburg, effective Jan. 1, is $2.30.

Fifty per cent ferro-silicon is quoted at $62.50 to $63.50, Pittsburg; domestic 12 per cent, $25.90; 11 per cent, $24.90; 10 per cent, $23.90, Pittsburg, for prompt, with $1 advance for first quarter and $2 for second quarter. The foreign grades are held at $1 or more a ton over domestic prices.

Plates.—Makers of plates declare that they are having no difficulty to obtain 1.60c on new business and there are reports in the market that premiums are already being paid for prompt shipment material. From the prospects before the market, it is believed that if a premium condition on immediate shipments with some mills has not already appeared, it is very likely to develop before the end of the first quarter. Specifications against contracts continue very liberal, and practically all low-priced contracts expiring at the end of the year will have been ordered out in full. The principal car order of the week placed was that of the Duluth & Iron Range and the Duluth, Missabe & Northern railroads for 1,500 steel ore cars from the Summers Steel Car Co., Pittsburg. These cars will be built by the Standard Steel Car Co., at its Hammond, Ind., plant, under a sub-contract. The plates and other material, about 15,000 tons, will be supplied by the Carnegie Steel Co., and this company will also equip the cars with 12,000 steel wheels. We quote present plate prices as follows:

Tank plates, ¼-inch thick, 6¼ to 100 inches, 1.55c to 1.60c. Extras are as follows, per 100 pounds: Boiler

and flange steel plate, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.20c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½-inch to and including 3/16-inch plate on thin edge, 0.10c; under 3/16 to and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—The sheet market continues one of the most active of all the finished lines. Requirement contracting for forward periods, principally first quarter and first half, has been liberally done, and already some of these buyers are endeavoring to increase the tonnages originally called for, since business is developing so satisfactorily that it is feared future needs have been underestimated. Specifications against contracts are being received in a heavy volume. On new business deliveries range from six to ten weeks. On prompt shipment material premiums of about $2 a ton are being obtained by some mills. There is a heavy demand for corrugated sheets for mill construction, and about 1,500 tons of such business is now pending for the Pittsburg district. Some recent contracting of importance calls for about 600 tons of corrugated sheets for the new mill buildings of the Republic Iron & Steel Co., at Lansingville, near Youngstown, O. We quote present sheet prices as follows:

Blue annealed sheets, Nos. 3 to 8 1.70c; Nos. 9 and 10 1.75c; Nos. 11 and 12, 1.80c; Nos. 13 and 14, 1.85c; Nos. 15 and 16, 1.95c; box annealed sheets, Nos. 10 and 12, 2.05c; Nos. 13 and 14, 2.10c; Nos. 15 and 16, 2.15c; Nos. 17 to 21, 2.20c; Nos. 22 to 24, 2.25c; Nos. 25 and 26, 2.30c; No. 27, 2.35c; No. 28, 2.40c; No. 29, 2.45c; No. 30, 2.55c; galvanized sheets, Nos. 12 to 14, 2.50c to 2.55c; Nos. 15 and 16, 2.60c to 2.65c; Nos. 17 to 21, 2.75c; Nos. 22 to 24, 2.90c; Nos. 25 and 26, 3.10c; No. 27, 3.30c; No. 28, 3.50c; No. 29, 3.60c; No. 30, 3.85c; painted roofing sheets, $1.70 per square for No. 28 gage, 2½-inch corrugation, and galvanized roofing sheets, $3 per square for No. 28 gage, 2½-inch corrugation.

Tin Plate.—Some of the makers of tin plate report that the condition of their books at the present time is the best in history. The regular buyers are all covered for their first quarter and first half needs, and the market is practically sold up to the fruit and vegetable canning season. Specifications are coming in very heavily and the mills are several months behind in deliveries. This condition has given rise to the appearance of premium business on prompt plate which is now being accepted by some makers. The independent makers are operating at a very full rate of capacity. The American Sheet & Tin Plate Co. is preparing for operation its Morewood plant at Gas City, Ind., which has not been active for years. We quote present tin plate prices as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.60 f. o. b. mill, Pittsburg district.

Rails and Track Material.—Some important negotiations in rails are pending and are expected to be closed shortly. Specifications against contracts for 1910 delivery are coming in quite freely, and it is stated that the Edgar Thomson mills have 50 per cent more tonnage on their books to be produced the first half than was rolled in the last half of 1909. The demand for light rails continues exceedingly brisk, the coal mining companies being a notable factor in this activity. At the same time, there is an active market for small spikes. The lumber companies are not doing so well in their buying of light rails. The standard spike market is not especially active. We quote standard Bessemer rails as follows, the base price for open-hearth rails being $30, mill:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails on base weight of 40 to 45 pounds, $28, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburg; standard spikes, 1.80c to 1.85c, Pittsburg; hand spikes, 1.80c to 1.90c, Pittsburg.

Steel.—There is considerable scarcity of open-hearth billets in tonnage lots among the producers of the Pittsburg district, and some consumers in this territory have been buying from outside mills, their excess needs over the tonnage coming to them on regular contracts. One consumer has purchased about 4,000 tons of standard 4 x 4 open-hearth billets from eastern mills at an average price of about $30.50, delivered Pittsburg. Bessemer billets are not as strong as open-hearth and are procurable at about $1 to $2 less per ton. Forging billets are hard to get and are commanding high prices. The sheet bar situation has shown no developments the past week and the market continues reasonably fixed at about $29, makers mill. Most consumers appear to be comfortably covered for their immediate needs through their regular sources of supply under long-term contracts, but makers are having no trouble to dispose of any prompt or first quarter bars they may offer. There is a disposition in the market among users to guard themselves carefully against any possible shortage growing out of makers' own needs of steel, and the increased sheet and tin plate capacity which will be on a consuming basis during the latter part of the first quarter and during the first half. Prompt bars have sold the present month at considerably higher than $29, Pittsburg basis. Most sales, however, are being made at makers mill, generally at $29 on standard long-length bars.

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $27.50 to $28, Pittsburg, with the usual extras for size and analysis, and open-hearth rolling billets from $28.50 to $29, Pittsburg. Forging billets are quotable at $31 to $32, Pittsburg. Sheet and tin bars are quoted at $29 to $29.50, Pittsburg.

Hoops and Bands.—The condition of the hoop market at the present time is quite satisfactory, and some of the leading makers have booked their outputs so heavily that they are extremely gratified with their position. Prices are strong, and it is understood that 1.55c, Pittsburg, is the absolute minimum. There is considerable contracting by large users for their needs after the first of the year. Specifications in bands are very heavy. We quote present prices as follows:

Hoops in carload lots, 1.55c to 1.60c; in less than carload lots, 1.65c to 1.70c; bands, 1.50c to 1.55c, base, with net extras as per standard steel.

Merchant Bars.—There is now practically no evidence in the market of the 1.45c price on steel bars, and the general level today is quotable at 1.50c, Pittsburg, by all the leading makers, although this level might be shaded where necessary on extremely desirable business. It is apparent that the market today is more firmly held at 1.50c, Pittsburg, that at any time since the open market declaration. Some makers report having obtained

1.55c on some forward business. While considerable new business is being offered for second quarter requirements, not a great deal is being taken by the mills because of the heavy tonnage on mill books and the continued specifying in a large volume. The final ordering on contracts expiring Jan. 1 is now being done by buyers, and there will be very little cancellation by makers of unspecified tonnage at that time. Bar iron business is very fair and there has been considerable contracting for first quarter, and in some cases for first half at today's prices. Some makers, however, are asking advances when obligating themselves beyond the first quarter. The shafting market continues very satisfactory and discounts are firmly maintained. We quote the market as follows:

Common iron bars, 1.70c to 1.80c, Pittsburg; Bessemer and open-hearth steel bars, 1.50c to 1.55c; plow and cultivator, 1.50c to 1.55c; channels, angles, zees, tees, under 3-inch, 1.60c to 1.70c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds, 0.15c advance; less than 1,000 pounds of a size, 0.35c advance. Cold rolled and ground shafting, 55 per cent in carloads and 50 per cent in less than carloads, delivered in base territory.

Planished and machine straightened tire is 1.60c base; iron finished tire under 1½ by 1½ inches, 1.55c, both plus net extra on tire card; iron finished tire, 1½ by ½ and over, 1.40c, plus net extra on the steel bar card.

On cold rolled strip steel, width 1½ inches and wider, and 0.100-inch and thicker, we quote base prices for 100 pounds, $3.20 on hard, and $3.45 on soft, except in carload lots of one size where the price is lower.

Structural Material.—Some of the leading independent fabricators report a surprising amount of structural business entered in December. The effect of the holidays is now upon the market, however, and it is not likely that much additional contracting will be done this year. On tonnages, the shipments of plain shapes from the mills are running from six to eight weeks, so that leading fabricators are not promising favorable deliveries on completed material in less than three months. The general market on structural steel continues at 1.60c. Bids were taken this week on 300 tons for new buildings at the Allegheny county home. The new open-hearth plants of the American Rolling Mill Co., 4,500 tons, and the Basic Steel Co., 1,000 tons, will be up for bids after the first of the year. The McClintic-Marshall Construction Co. will furnish 1,000 tons for the new plant of the Garry Iron & Steel Co., Youngstown, O. We quote the market on structural shapes as follows:

Beams and channels, 15-inch and under, 1.55c to 1.60c; over 15 inches, 1.65c to 1.70c; zees, 1.55c to 1.60c; tees, 1.55c to 1.60c; angles, from 3 to 6 inches, 1.55c to 1.60c; over 6 inches, 1.55c to 1.70c; universal and sheared plates, 6¼ inches wide and wider, 1.55c to 1.60c.

Merchant Pipe.—The National Tube Co. has issued its re-classification of wrought pipe, effective Jan. 1, which is an effort toward a more complete standardization of weights and sizes. Merchant pipe, which is now based on merchant weight or catch weights, will, under the new card, be based upon card rates, although when specified, merchant weights in sizes from ⅛-inch to 6 inches will be furnished. Some new sizes have been placed upon the card. The full result of the changes leaves the net price to buyers at just about the point prevailing under the present schedule. The needs of jobbers in merchant pipe have been well supplied under contracts previously placed, but there is a very fair specifying movement for this period of the year. The prospects for spring business in line pipe and other tubular goods are pronounced excellent. We have revised our prices and quote the following official discounts on merchant pipe in carloads, subject to the usual additional discounts to the largest buyers:

	—Steel—		—Iron—	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch.....	70	54	65	..
⅜ inch	71	57	66	52
½ inch	74	62	69	57
¾ to 6 inch	78	68	73	63
7 to 12 inch	72	57	68	51
13 to 15 inch	51½	..	..	..
PLUGGED AND REAMED.				
1 to 4 inch	76	66	71	61
EXTRA STRONG PLAIN ENDS.				
⅛ to ¾ inch.....	63	51	58	46
½ to 4 inch	70	58	65	53
4½ to 8 inch	66	54	61	49
9, 10, 11 and 12 inch.	59	47	..	..
DOUBLE EXTRA STRONG PLAIN ENDS.				
½ to 8 inch	59	48	54	43

Boiler Tubes.—A fair amount of contracting in locomotive and merchant tubes for forward requirements is going. The market throughout shows a sustained improvement, although there is some seasonable quietness at the present time. We quote the following official discounts on boiler tubes to the large buyers:

	Steel.
1 to 1½ inch.....	49
1¾ to 2¼ inch.....	61
2½ inch	63
2¾ to 5 inch	69
6 to 13 inch	60

2½ inch and smaller, over 18 feet, 10 per cent net extra.

2¾ inch and larger, over 22 feet, 10 per cent net extra.

To destinations east of the Mississippi river will be sold at delivered discount for carloads lowered by two points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburg.

	Iron.
1 to 1½ inch	43
1¾ to 2¼ inch.....	43
2½ inch	48
2¾ to 5 inch.....	55
6 to 13 inch.....	43

Wire Products.—At the present time, business in the market of wire products is rather quiet, owing to the between-seasons period at hand. The trade has been well covered for its needs up to February at the former prices of $1.80 on nails and $1.60 on wire, and not a great deal of new business is being done at the advanced prices. The manufacturing trade is doing some buying of common wire products for first quarter and first half at $1.70. Makers of wire products are especially gratified at the outlook before the market. We quote the market as follows, contracts with the jobbing trade being limited usually to 60 days:

Wire nails, jobbers' carload lots, $1.85; retailers' carload lots, $1.90; painted barb wire, jobbers' carload los, $1.85; retailers' carload lots, $1.90; with 30c for galvanizing; plain wire to jobbers in carloads, $1.65, and to dealers in carloads, $1.70; polished staples, $1.85; galvanized staples, $2.15.

Wire Rods.—Further sales of Bessemer rods at outside mills at prices exceeding $33, Pittsburg territory, are reported. Little new business is being taken, as consumers are well covered. We quote the market at $33 and $34, Pittsburg, on Bessemer and open-hearth rods.

Coke.—While the spot coke market early in the week developed more softness, the usual interruption of oven operations due to Christmas festivities among the laborers together with the effect of storm conditions upon the freight movement gave the situation a better tone at the close. It is predicted that production will materially fall off this week, and it is anticipated that the shortage of cars will be felt more acutely within the next several days. At the fore part of the week, a furnace company bought 5,000 tons of standard old region Connellsville coke from stock at about $2.50, ovens. Later sales of high grade spot coke at $2.70, ovens, were reported. Some consumers who have been unwilling to take chances with bargain offerings have paid $2.75, ovens, one valley interest taking 3,000 tons for January shipment at this figure. Some other January business was also negotiated this week at this price. Despite the softness in spot coke, the contract market appears firm at a

minimum of $2.75, ovens. Foundry coke also appears a little easier, although consumers continue to urge shipments for their requirements. Water shortages in the coke regions are still causing difficulties in operations. We quote standard Connellsville furnace coke for prompt shipment at from $2.60 to $2.75, ovens, and on contract at from $2.75 to $2.80, ovens. On first grade Connellsville foundry coke we quote from $3.10 to $3.25, ovens, for prompt and from $3.25 to $3.40, ovens, on contract. The *Courier's* figures for the week ending Dec. 18 show 35,753 ovens active with an output of 452,735 tons, compared with 35,412 active ovens and a production of 738,765 tons the previous week.

Old Material.—The scrap market this week has displayed the usual dullness of the final week of the year and buyers have remained quite disinterested in prices and tonnages. While there is no buying activity among consumers, the dealers are also not showing any anxiety to sell, for their attitude remains bullish on the market's future. Some of the dealers are emphasizing their confidence in an upward turn to conditions by paying producers' prices, which users do not see fit to offer. In some grades, however, a softness is being disclosed under the light support from buyers. Malleable scrap has eased off a point in the week. We quote gross tons delivered in the Pittsburg district, including Monessen, Sharon, Brackenridge, Follansbee and Steubenville, as follows:

Heavy melting scrap	$17.75 to 18.00
Rerolling rails	18.50 to 19.00
Bundled sheet scrap	15.50 to 16.00
Iron axles	27.00 to 27.50
Old iron rails	19.50 to 20.00
No. 1 wrought scrap	19.00 to 19.25
Old car wheels	17.00 to 17.50
Low phosphorus	22.00 to 22.50
Machine shop turnings	13.00 to 13.50
Cast borings	10.75 to 11.25
No. 1 cast scrap	16.50 to 17.00
Malleable	16.50 to 17.00
Stove plate	14.00 to 14.50

CHICAGO.

Banner Year in History of West—Apathy in Pig Iron.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Dec. 28.

All makers of iron and steel products coincide in the opinion that 1909 was the banner year in the history of the west from the standpoint of their business. Taking the figures compiled by one local mill of its sales this year as a basis, the consumption of iron and steel in the west has increased in the past 12 months nearly 100 per cent over the preceding year. Productive capacity has not in any way kept pace with consumptive demand, despite the tremendous increases at Gary and elsewhere; and the expenditure of many millions of dollars in furnaces and rolling mills in this territory is planned for 1910. The largest fabricator of structural steel in the west is authority for the statement that in Chicago alone there are building projects pending involving over 200,000 tons of steel, which is exclusive of the requirements of railroads and shipbuilders. Two local firms of architects have jobs aggregating 170,000 tons in their offices. Where this material will come from with mills already heavily oversold, it is hard to say, but with no untoward circumstances or events, 1910 bids fair to eclipse all previous records in production and consumption. Mills are carrying over into the new year tremendous undelivered tonnages. They are "snowed under" with specifications and have no hope of relief until new capacity starts up. Blast furnaces are likewise pretty well sold up for three to five months of the near year, and while prices are temporarily soft, it is believed pig iron will stiffen perceptibly after Jan. 15. Advances are also expected in bars, sheets, plates and structurals sufficient to meet the premiums that are now being exacted by those able to furnish the material. Instead of famine and idleness stalking over the land, as was the case two years ago, prosperity has spread its mantle over the nation, proving the prediction of the outcome of a year of sane politics.

Pig Iron.—Apathy characterizes the local pig iron market. Such inquiries as are before furnaces are considered more in the nature of "feelers" rather than in the light of actual wants. Both buyers and sellers are pursuing a strictly waiting attitude. The market is undeniably softer, but how long it will continue thus, is problematical. History has but repeated itself in the creation of this condition at the close of another year. To complete the illustration, there must follow a sharp reaction about the middle of January or the first of February. In past years, the market has always rebounded about $1 to $2 a ton higher at this time. It may do so next month. Every condition exists to cause one to believe that it will. Business is good, spot iron is in demand, cars are scarce, and snow and labor conditions are crippling traffic service. Complaints already are being heard of slow deliveries from the south, and unless the weather moderates, spot iron will soon be selling at a premium rather than at a concession, as is now the case. It is reliably stated that less than $14, Birmingham, has been done on Southern iron in the week under review. Special conditions, however, surrounded this transaction, and the price cannot be duplicated today. Fourteen dollars is the absolute minimum at which Southern No. 2 can be had, and for this price deliveries can be extended over the first half of 1910. Local irons are unchanged in price, though Chicago producers have suffered from the competition of Ohio furnaces in the past two weeks. The latter are offering No. 2 foundry on the basis of $18.90, Chicago, and several purchases have been made at this price. There are several good sized inquiries for northern iron in the market, one for 4,000 tons of foundry from a Wisconsin melter, and another for 2,000 tons of malleable from a Michigan concern. We quote as follows:

Lake Superior charcoal	$20 00 to 20.50
Northern foundry No. 2	19 00 to 19.50
Southern foundry No. 2	18.35 to 18.85
Southern silveries, 5 per cent sflicon	19.90 to 20.40
Jackson Co. silveries, 8 per cent	21.40
Malleable Bessemer	19.00 to 19.50
Alabama basic	19.35 to 19.85

Billets.—The shortage in all forms of intermediate steel at western mills well nigh amounts to a famine. Nothing but contract specifications are being taken care of and the tonnage available for these is doled out proportionate to the requirements of each consumer. New business is offered in very large tonnages and handsome premiums could be secured if the deliveries could be made. But in almost every instance the offerings are declined. Although no quotations are made by mills, they state a fair price would be between $30 and $35 base, Chicago, for forging billets. Wire rods remain nominally at $33, Pittsburg, but the American Steel & Wire Co. is accepting no new business. It is doubtful if the local steel shortage will be relieved before April or May, about which time the Inland Steel Co. expects to start up two new open-hearth furnaces. The Illinois Steel Co. is sold tight for the first five months of 1910.

Merchant Bars.—It is the universal opinion that not in a decade has a year closed with mills in such an impregnable position as they hold at this time. It is equally true also that a new year has not been ushered in under more favorable auspices for the steel industry than 1910. Practically all the western mills have steel bar specifications in hand for five months delivery and contracts on their books that will run them well into the second half. Those consuming interests unfortunate enough to have underestimated their requirements are paying premiums of $1 to $2 a ton for quick deliveries of steel bars, and are even having trouble to get the material at this price. The independent interests are taking practically all this business, the Steel Corporation not booking anything additional that requires a specified delivery. New tonnage for iron bars is inclined to be quiet, though the dullness is considered of a holiday or inventory character rather than a let-up in consumption. Prices remain firm at a minimum of

1.60c, Chicago. Small business is 50 cents to $1.00 a ton higher. It is reported a large number of cars is being figured on by railroads which will be let after the first of the year, and a quickening of the bar iron market is looked for about this time. There is no change in hard steel bars, other than that the market is sentimentally stronger because of an improvement in the scrap situation. We quote for Chicago delivery, as follows, with prevailing extras:

Bar iron, 1.60c to 1.65c; hard steel bars, re-rolled, 1.60c to 1.65c; soft steel bars and bands and small shapes, 1.68c to 1.78c base; hoops, 1.78c to 1.88c; planished or smooth finished tire steel, 1.88c to 1.93c; iron finish, up to 1½ x ¼ inch, 1.83c base, tire card; iron finish, 1½ x ½ inch and larger, 1.68c, base, bar card; channel for solid rubber tires, ¾ to 1 inch, 2.18c, flat, and 1⅛ inches and larger, 2.08c, flat; smooth finished machinery steel, 1 inch and larger, 2.43c; flat sleigh shoe, 1.73c; toe calk steel, 2.23c; spring steel, 2.28c; crucible spring steel, 2.78c; tool steel, 7c to 9c, with higher prices for special grades. Quotations on shafting are 55 per cent off the list for carload lots, and 50 per cent off for less than carload lots, carload freight allowed to points in base territory.

On iron and steel bars from local stocks, we quote, as follows: Bar iron, 2c to 2.10c, base; soft steel bars, 1.90c to 2c per 100 pounds, base; soft steel hoops, 2.40c to 2.50c, full extras.

Plates.—No diminution is noted in the demand for plates. The local mills are literally "snowed under" with specifications, and the leading producers have withdrawn from the market. New tonnage is offered very freely, but the bulk of it goes to eastern interests. Western distributors are also profiting handsomely by existing mill conditions, their ability to give immediate shipment attracting considerable tonnage to their stores. Official quotations are merely nominal; from a price standpoint the market is an open one.

We quote, Chicago delivery, as follows: Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.78c to 1.88c. For extras see Pittsburg report.

Store quotations are without change as follows: Tank steel, ¼ inch and heavier up to 72 inches wide, 2c to 2.10c; from 72 inches to 96 inches wide, 2.10c to 2.20c; 3/16 inch up to and including 60 inches wide, 2.10c to 2.20c; 72 inches, 2.35c to 2.45c; No. 8 up to 60 inches wide, 2.15c to 2.25c. Flange and head quality, 25c extra.

Sheets.—It is very possible that independent mills will advance their prices after the first of the year. The demand far exceeds the supply and there is no indication that this condition will be reversed for several months to come. Blue annealed and galvanized sheets have commanded a premium for some time, and it is the belief of some producers that these conditions will be equalized in the form of an advance in the near future. Crude steel is very scarce and high in price and additional tonnage is almost impossible to obtain. The Inland Steel Co. expects to have its two new open-hearth furnaces, additional mills and galvanizing pots in operation early this spring, which will correspondingly increase its output of black and galvanized sheets.

For mill prices see Pittsburg report. Freight to Chicago, 18 cents.

We quote store prices at Chicago as follows: No. 10, 2.25c to 2.35c; No. 12, 2.30c to 2.40c; No. 14, 2.35c to 2.45c; No. 16, 2.45c to 2.55c; Nos. 18-20, 2.80c to 2.90c; Nos. 22-24, 2.85c to 2.95c; No. 26, 2.90c to 3.00c; No. 27, 2.95c to 3.05c; No. 28, 3.00c to 3.10c; No. 30, 3.30c, galvanized sheets, Nos. 10 and 16, 3.20c to 3.30c; Nos. 18 and 20, 3.35c to 3.45c; Nos. 22 to 24, 3.50c to 3.60c; No. 26, 3.50c to 3.80c; No. 27, 3.90c to 4.00c; No. 28, 4.10c to 4.20c; No. 30, 4.50c to 4.60c.

Wire Products.—The heavy snowfall of the last week, following closely on the heels of the ralroad labor strike, has seriously crippled deliveries of wire products. The shortage is especially keen in all parts of the northwest, and dealers in that territory are clamoring for relief. Stocks in the hands of the American Steel & Wire Co. are unusually high for this time of the year, but with traffic relief these will rapidly diminish. Inquiry is already being felt for spring requirements, and an active demand from southwestern points is anticipated after the first of the year. Prices are without change but firm. We quote, Chicago delivery, as follows:

Wire nails, jobbers' carload lots, $2.03; retailers' carload lots, $2.08; retailers' less than carload lots, $2.18; painted barb wire, jobbers' carload lots, $2.03; retailers' carload lots, $2.08; retailers' less than carload lots, $2.18; with 30c for galvanizing; plain wire to jobbers, carload lots, $1.83; staples, bright, $2.03.

Structural Material.—Some comprehension of the tremendous structural requirements of the country in 1910 may be gathered from the statement of an official with a large fabricating interest that in Chicago alone his company is in touch with projects that will require approximately 200,000 tons of structural steel. One half of this work is actually under consideration; that is, plans and specifications have been drawn and bids are being received; the other half has not yet assumed concrete shape, but is simply under discussion. This enormous tonnage involves only bridges and buildings; it does not include either railroad or shipbuilding work. It is a fair indication of the burden of orders mills will be under during the forthcoming year. No improvement is noted in the mill situation. The local plants are filled with specifications for four to six months. Contracts closed during the week include the following: Amador County, Cal., bridges, 300 tons, let to Berkley Steel Co., San Francisco; Utah Light & Railway Co., transmission towers, 100 tons, let to Milliken Brothers, New York; State House Hotel, Sacramento, Cal., 140 tons, steel contract let to Noelke-Richards Co., Indianapolis; Mt. Vernon Car Co., Mt. Vernon, Ill., additions to its shops, 1,614 tons, awarded to McClintic-Marshall & Co.; Crerar, Adams & Co., additions to warehouse, 985 tons, Brown-Ketcham Iron Works, Indianapolis, Ind. The American Bridge Co. secured the contracts for the plate girder bridges for the Western Indiana & Belt Railway, 270 tons, and from the Indiana Harbor R. R., 300 tons. It also has received a contract for 2,000 tons of axles. The Minneapolis Steel & Machinery Co. has received the Soo Line contract for 500 tons of plate girder bridges. The Plymouth Building, of Minneapolis, will be built entirely of concrete. Steel construction was the original intention, and the plans called for about 4,000 tons. About 2,000 tons of reinforcing bars will now be required.

We quote mill prices for structural shapes, Chicago delivery, as follows:

Beams and channels, 15-inch and under, 1.78c to 1.88c. For extras see Pittsburg report.

Local store prices are as follows: All angles, 3 inches and larger, including 6 inches, $2 to $2.10 per 100 pounds; angles over 6 inches, $2.10 to $2.20 per 100 pounds base; beams, 3 to 15 inches, inclusive, $2 per 100 pounds base; channels, 3 inches and larger, $2 per 100 pounds base.

Merchant Pipe and Boiler Tubes.—There are no new conditions in this market. This is inventory period and new business is light.

For mill discounts, see Pittsburg report.

We quote, out of store, as follows: Wrought steel pipe, black, ⅛-inch to ¼-inch, 68 per cent; ⅜-inch, 69 per cent; ½-inch, 72 per cent; ¾-inch to 6-inch, 76 per cent; 7-inch to 12-inch, 71 per cent. Iron pipe about 6 points higher.

Lap-welded steel tubes, 2¾-inch to 5-inch, 60 to 62 per cent; charcoal iron tubes, 2¾-inch to 4-inch, 48 to 50 per cent; seamless steel tubes, 2¾-inch to 4-inch, 47½ per cent.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. has been awarded the Kansas City, Kan., contract for 800 tons of water pipe; it also received the contract from Pontiac, Mich.,

for 1,100 tons. The Minneapolis inquiry for 2,500 tons has not yet been let. Railroads are inquiring and buying briskly of culvert pipe, and a heavy spring trade is expected. We quote as follows: 4-inch water pipe, $28.50; 6 to 16 inches, $27.50; larger sizes, $26.50; gas pipe, $1 a ton higher.

Rails and Track Supplies.—Sales approximating 7,000 tons were closed last week. The largest inquiry of the week is for 70,000 tons from the Baltimore & Ohio. Bids are asked on both Bessemer and open-hearth rails. Light rails are quiet.

See Pittsburg report for prices on standard sections.

On light rails, Chicago delivery, we quote as follows: Light rails, 40 and 45-pound, $26.30, and 35-pound, $26.75, 16, 20 and 25-pound, $27; 12-pound, $28. In lots of 250 to 500 tons a reduction of 60c a ton from these prices is made; lots of 500 tons and up carry a reduction of $1 a ton. Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; railroad spikes, 1.80c to 1.90c; smaller size spikes, 1.85c to 1.90c, base; track bolts with square nuts, 2.35c to 2.55c, base; with hexagon nuts, 2.50c to 2.70c.

Old Material.—Traffic delay consequent upon labor strikes and heavy snow storms has created a considerable demand for spot scrap. This will doubtless be intensified by the difficulty of collecting scrap until the snow has melted, and a stiffening of prices is felt to be the outcome. The weather conditions will also bring to a temporary halt the bear operations of a clique of large dealers, who have for some weeks been striving to lower the market on heavy melting steel and kindred lines. We have advanced several of our prices, and quote as follows:

Old car wheels	$18.00 to 18.50
Old iron rails	20.00 to 20.50
Rerolling rails (4 ft. and over)	17.75 to 18.25
Old steel rails (2 ft. and under)	17.00 to 17.50
Light section relayers, 45 lbs. and under subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	24.50 to 25.00
Frogs, switches and guards	16.00 to 16.50
Heavy melting steel	16.00 to 16.50
Shoveling steel	15.00 to 15.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$15.00 to 15.50
No. 2 R. R. wrought	14.00 to 14.50
Arch bars and transoms	17.75 to 18.25
Knuckles, couplers and springs	14.25 to 14.75
Shafting	17.50 to 18.00
Iron car axles	21.25 to 21.75
Steel car axles	20.50 to 21.00
Locomotive tires	18.00 to 18.50
Dealers' forge	12.25 to 12.75
Pipes and flues	11.50 to 12.00
No. 1 cast, 150 lbs. and less	14.25 to 14.75
No. 1 busheling	13.00 to 13.50
No. 2 busheling	9.75 to 10.25
No. 1 boiler cut	11.25 to 11.75
Boiler punchings	16.00 to 16.50
Cast and mixed borings	7.50 to 8.00
Machine shop turnings	10.50 to 11.00
Railroad malleable	15.00 to 15.50
Agricultural malleable	13.25 to 13.75
Stove plate and light cast scrap	12.25 to 12.75
Angle bars, splices, etc. (iron)	17.25 to 17.75
Angle bars, steel	15.50 to 16.00

CLEVELAND.

Fifty Cents Advance on Non-Bessemer Ores—Buying Not Active.

Office of THE IRON TRADE REVIEW,
Browning Building, Dec. 28.

Iron Ore.—For the first time in many years, prices of Lake Superior ores have been fixed without a meeting of representatives of the ore companies. After the advance of 50 cents per ton on Bessemer ores announced last week in these columns, an important interest outside of Cleveland made sales of non-Bessemer ores at the same advance. Among those who had in past years acted in harmony in price adjustments were some who favored an advance of from 35 to 40 cents on non-Bessemer ores, but they acquiesced in tthe advance of 50 cents after it was announced that the sales at the higher prices had been made. "The market simply fixed itself," was the way in which one ore representative expressed the situation. Following the advance on Bessemer ores, practically all Bessemer ores were sold; that is, the reservations which had been made some time ago were quickly converted into actual contracts. While some sales of non-Bessemer ores have been made, furnace men are not showing any haste about placing orders, as they did in November, 1906, when prices were fixed at the same quotations as those now being made for 1910, and all ore for sale was disposed of in 10 days. In November, 1906, both Bessemer pig iron and No. 2 foundry pig iron were quoted at $21.50, valley, as compared with $19 for Bessemer and $17.25 for No. 2 foundry at the present time. A leading furnace operator stated today that an advance of 50 cents per ton on non-Bessemer ores and the higher costs for coke will mean an increase in costs of foundry pig iron in the valley to at least $17 per ton, compared witth present cost of about $14.50. There will doubtless be some complaint on the part of furnace men in regard to the advance on non-Bessemer ores, and there may be some delay awaiting developments of the market; but if the prosperity generally expected to prevail during the new year materializes, the non-Bessemer ores will quickly be disposed of. No change has been made in the base guarantee of either Bessemer or non-Bessemer grades.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range, Bessemer, $5; Mesabi Bessemer, $4.75; old range non-Bessemer, $4.20; Mesabi non-Bessemer, $4.

Pig Iron.—The most encouraging sign of the pig iron market is the increasing tendency to ask for anticipation of deliveries. A number of foundries of this city are finding that they are melting more rapidly than anticipated. There is some disposition to sound the market for the second half of the year, but furnaces are slow to quote for that delivery. Several inquiries of fair size for first half are pending, but transactions are few. We quote, delivered in Cleveland for first half of next year, as follows:

No. 2 foundry	$17.90 to 18.00
No. 2 Southern	18.35
Gray forge	17.15 to 17.40
Bessemer	19.90
Lake Superior charcoal	19.50 to 20.00
Jackson Co. 8 per cent silvery	20.55

Coke.—The market remains quiet, and very little business is being done. For prompt delivery, Connellsville furnace is quoted at $2.60 to $2.75, and for contract, $2.75 to $2.80. On foundry coke, we quote $3.10 to $3.25 for prompt and $3.25 to $3.40 for first half.

Finished Material.—The leading interest, which had a large number of contracts expire Dec. 15, reports that not a ton was unspecified. Other interests having contracts expiring Jan. 1, state that nearly the complete tonnage has been specified, and there will be practically no cancellations. Owing to the fact that specifying has been done at a very lively rate until very recently, little in this way remains to be done this week, and offices are not now so rushed with work in keeping up specifications. The leading interest took an order for 2,000 tons of plates and shapes for a packet freighter for the Anchor line, and 500 tons for reconstruction of two badly damaged boats. There will be a very large amount of repair work done by the ship building plants this winter.

Old Material.—The local scrap market continues in such a state of lifelessness that no predictions whatever can be made as to what the future will bring. Dealers insist that the prices of raw scrap and the costs of preparing it for grading are such that they would sustain actual losses, were they to sell at prices that are offered by the few buyers in the market. Not enough buying and selling is taking place that actual quotations can be given, and the prices given below are nominal. We

continue to quote, gross tons, f. o. b. Cleveland, as follows:

Old iron rails	$20.00 to 20.50
Old steel rails (under 6 feet)	17.50 to 18.00
Old car wheels	17.50 to 18.00
Old steel boiler plate	14.00 to 14.50
Malleable iron (railroad)	17.00 to 17.50
Steel axles	19.50 to 20.00
Malleable iron (agricultural)	15.00 to 15.50
Heavy steel	16.25 to 16.75
Country mixed steel	14.00 to 14.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$16.00 to 16.50
No. 1 busheling	14.00 to 14.25
No. 1 machine cast	15.00 to 15.50
Axle turnings	11.00 to 11.50
Machine shop turnings	10.50 to 11.00
Grate bars	12.50 to 13.00
Pipes and flues	12.00 to 12.50
Tank iron	11.50 to 12.00
Sheet iron	6.50 to 7.00
Wrought drilling	10.50 to 11.00
Stove plate	12.00 to 12.50
Cast borings	8.50 to 9.00

CINCINNATI.

No Large Transactions Reported—Position of Furnaces Compared.

Office of THE IRON TRADE REVIEW,
First National Bank Bldg., Dec. 28.

Pig Iron.—The week has been rather quiet in this market, with no large transactions reported and but little inquiry under consideration. A local melter is inquiring for 1,000 tons of southern No. 2 and 1,000 tons of northern No. 2 for first half delivery. A central Ohio manufacturer is in the market for 700 tons of No. 2 and 300 tons of No. 1 foundry for first half delivery and an Indiana melter is figuring on 1,000 tons of malleable for first half delivery. There is an inquiry from the south for 500 tons of gray forge for prompt and first quarter delivery. There are few scattering 100 to 300 ton lots upon which quotations have been made, which are not yet closed. The rank and file of melters appear to be but little interested in the market. Prices are without change and southern iron is quotable at $14, Birmingham, for prompt delivery, or through the first half, although some producers are holding at from $14.50 to $15. Northern iron appears to be generally quotable at $17 at furnace in the Hanging Rock district for prompt shipment or through the first half. Under the present conditions, with a spread of $3 per ton between northern and southern iron, the price advantage is in favor of the southern producer and enables southern iron to reach a larger territory than usual, at equal prices with northern or slightly lower. The northern furnaces appear to be in stronger position than the southern as the northern producers have considerable tonnage booked for first half delivery, while the southern furnaces have sold only a portion of their first quarter production and have taken but little business for the second quarter. It may be recalled that the southern furnaces refused to open their books for second quarter business until the market had reached $15, Birmingham, for first quarter delivery. After the $15 price became established for first half the market lagged and weakened. This feature of the situation makes it appear that the southern market is weak owing to lack of demand and the unsold tonnage in sight for the first half of 1910. The strong features of the situation are the heavy consumption of pig iron and the sold-up condition of the northern furnaces. There is belief in some quarters that the severe winter conditions prevailing are likely to seriously hamper transportation, which would be influential in creating a stronger spot market should such conditions develop and be prolonged. We quote for prompt shipment and delivery through the first half of 1910, delivered Cincinnati, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, as follows:

Southern foundry No. 1	$17.75 to 18.25
Southern foundry No. 2	17.25 to 17.75
Southern foundry No. 3	16.75 to 17.25
Southern foundry No. 4	16.75 to 17.00
Southern No. 1 soft	17.75 to 18.25
Southern No. 2 soft	17.25 to 17.75
Southern gray forge	16.50 to 16.75
Northern No. 1 foundry	18.70
Northern No. 2 foundry	18.20
Northern No. 3 foundry	17.70
Jackson county 6 per cent silicon	19.20
Jackson county 8 per cent silison	20.20
Jackson county 10 per cent silicon	21.20

Finished Material.—There is still a persistent call for shipments on contracts based on the maximum estimated requirements for the last half of 1909. Jobbers' stocks are getting into fairly good condition as they have been taking everything that the mills could ship. There is some little interest in first quarter business and mills are generally quoting $1.45, Pittsburg, on steel bars for first quarter delivery.

Coke.—As has been anticipated, there is a falling off in the shipments in coke due to the holiday shut-down, as well as the winter conditions, which are interfering to some extent with transportation. Prices are without material change. Quotations in the leading coke-producing districts are as follows:

	Prompt shipment.	First half 1910.
Connellsville district:		
Foundry coke	$3.10 to 3.35	$3.35 to 3.50
Furnace coke	2.75 to 2.80	2.75 to 3.00
Wise county district:		
Foundry coke	2.75 to 3.00	3.00 to 3.50
Furnace coke	2.00 to 2.25	*Sliding [scale basis.
Pocahontas district:		
Foundry coke	3.00 to 3.10	3.00 to 3.25
Furnace coke	2.65 to 2.75	2.75

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16⅔ per cent of the amount over $9 at which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Old Material.—Dealers are inclined to hold their stocks at steady prices under the feeling that but little can be gained by attempting to sell on a dull market, and there is expectation that after the first of the year an improved demand is likely to develop. Buyers and sellers are showing but little interest in the market, therefore, at this time and, while some low-price scrap might be obtained, the general situation of prices is about the same as a week ago. Dealers' prices here are as follows:

Old No. 1 R. R. wrought, net tons	$13.50 to 14.00
No. 1 machinery, net tons	13.50 to 14.00
No. 1 busheling, net tons	13.00 to 13.50
Old iron rails, gross tons	18.00 to 18.50
Old steel rails (re-rolling), gross tons	17.00 to 17.50
Old short lengths, gross tons	15.50 to 16.50
Old iron axles, net tons	19.00 to 19.50
Heavy melting scrap, gross tons	14.50 to 15.00
Stove plate, net tons	10.50 to 11.00
Heavy turnings, net	9.25 to 9.75
Cast borings, net tons	8.00 to 8.50
Car wheels	15.50 to 16.00
Grate bars	12.00 to 12.50

PHILADELPHIA

Basic and Low Phosphorus Users Want Iron Immediately.

Dec. 28.

Pig Iron.—There is a very considerable and increasing demand for anticipated shipments, this coming from some of the largest consumers and having reference particularly to basic and low phosphorus iron. In certain instances, of late, this has taken the form of requesting deliveries on account of contracts beginning with the year, compliance with which has not been possible owing to the fact that eastern furnaces generally are now and for some time have been running, with practically no stocks on their yards. These unmistakable indications of a heavy current consumption, right through the holiday period, are one of the strongest features of the market. Another is the fact that, in spite of an absence of buying for fully a month, the price level has not settled to exceed 25 cents a ton, from the top figures reached during the active buying period. No. 2X foundry, on which for a time a delivered price of $19.25 was quite general, is now well established at $19, and basic is still nominally $18.75, or 25 cents below the high mark, although there have been no transactions of late to confirm this figure. We note a sale of 3,000 tons of low phosphorus iron, with a maximum of 0.035, for first half delivery in the Pittsburg district at within the limits quoted below, but it cannot be learned that any of the other inquiry recently reported as current has been closed. Pipe works in the district have bought 4,000 or 5,000 tons of low

grade irons for early shipment, and a puddling interest has taken on 1,000 tons of gray forge at the market quoted. Inquiries are few and the next three or four weeks will doubtless see business extremely light. It is anticipated that the severe snow storm of Dec. 25-26, which played havoc with eastern railroads, will not affect the coke market except on spot and may weaken the situation by throwing the eastern requirements for a time on the western market. Good Connellsville foundry coke is quoted at $5.25 to $5.40, delivered into this territory, with Latrobe substantially the same. On pig iron for first quarter, delivered at eastern Pennsylvania points, we quote:

No. 1X foundry	$19.50 to 20.00
No. 2X Foundry	19.00 to 19.25
No. 2 plain	18.50 to 19.00
Standard gray forge	17.50 to 18.00
Basic	18.75 to 19.00
Low phosphorus	22.75 to 23.25
No. 2 Birmingham	19.00 to 19.50
No. 2X Virginia	19.50 to 20.00
No. 2 plain Virginia	19.00 to 19.50

Finished Materials.—The year is closing with the market inactive in the extreme and some indications that for first quarter contracts Pittsburg mills are willing to quote 1.50c on desirable tonnages, though eastern interests are booking some business at 1.60c, Pittsburg. There is still a complete absence of rail orders. In structural work, the Vine street pier steel requirements are as yet uncovered, and the large hotel project for Baltimore has proceeded no further than the appointing of Purdy & Henderson as engineers. Bids are going in on a 1,500-ton apartment house at Thirteenth and Spruce streets for Frank Mauran. Bethlehem sections will be used for a blacksmith shop at Eddystone for the Baldwin Locomotive Works, 500 tons, and for the Sterrick Creek breaker of the Temple Iron Co., 350 tons. We quote, Philadelphia delivery, as follows: Structural shapes and plates, 1.65c to 1.75c; steel bars, 1.60c to 1.70c; refined bar iron, 1.60c to 1.75c; open-hearth billets, $30.60.

Old Materials.—The market presents no important changes. The new association price of $17 is for delivery at the most distant consuming point represented, but this figure is not effective as yet, inasmuch as brokers are now buying to cover tonnages sold on a considerably higher level. We quote, gross tons, eastern Pennsylvania delivery, as follows:

Old steel rails (rerolling)	$18.50 to 19.00
Relaying rails	21.00 to 21.50
No. 1 steel scrap	17.00 to 17.50
Old car wheels	17.00 to 17.50
Old iron car axles	26.00 to 27.00
Old steel car axles	23.00 to 24.00
No. 1 railroad wrought	18.00 to 18.50
Iron track scrap	16.00 to 16.50
Wrought pipe	16.50 to 17.00
Cast borings	12.50 to 13.00
Wrought turnings	14.00 to 14.50
Heavy cast scrap	17.00 to 17.50
Railroad malleable	16.75 to 17.25
Stove plate	13.00 to 14.00

BUFFALO.

More Inquiries for Pig Iron—Some Fair Sized Building Planned.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Dec. 28.

Pig Iron.—While the market is quiet, it has a firm tone, and inquiries are more numerous than they were last week, some of which are for large tonnage. The call for iron represents practically all grades but is led by foundry and malleable and buyers are showing a stronger disposition for covering their needs for the first half. The demand for malleable is showing a betterment. Prices have not changed. Interests continue to differ to some extent on prices, but all the furnaces are well sold up. In this respect it is notable that certain consumers of large tonnage who were understood to be covered for the greater part of 1910 are now pressing the furnaces to deliver all their January quota at once. Shipments are moving out fully as rapidly as reported for several weeks past and the furnaces are running to the limit of production. What effect the announcement today of an addition of two furnaces to this territory will have upon the market cannot be told, but it is the general belief that the growth of this market will easily take care of the increase in output. The stacks referred to will supplement the present daily output by about 800 tons. We quote first quarter delivery, f. o. b. Buffalo, as follows:

No. 1X foundry	$17.25 to 17.75
No. 2X foundry	16.75 to 17.25
No. 2 plain	16.75 to 17.00
No. 3 foundry	16.25 to 16.50
Gray forge	16.00 to 16.50
Malleable Bessemer	17.25 to 18.25
Basic	18.25 to 18.75
Charcoal	20.00 to 21.00

Finished Products.—This market is quiet with a good outlook for the early part of 1910. The bids on about 400 tons of structural for the Buffalo Foundry & Machine Co.'s new machine shops are in, but the contract has not been awarded. It was announced today that the Snow Steam Pump Works had prepared plans calling for an addition to its plant here and involving about 350 tons. The Spencer Kellogg Co., of Buffalo, is in the market for about 400 tons to be used in constructing a linseed factory at Edgewater, N. J. The newly organized Rogers-Brown Iron Co. will build two blast furnaces at South Buffalo.

Old Material.—While the consumption of old material continues to be heavy, the supply secured by the leading consumers keeps them out of the market and inquiries are light and scattering and mostly for small tonnage. Quotations are unchanged but the tendency of the market is toward depression and shaded prices could probably be secured on some tonnage. We quote, f. o. b. Buffalo, gross tons, as follows:

Heavy melting steel	$16.50 to 17.00
No. 1 railroad wrought scrap	18.25 to 18.75
No. 1 railroad and machine cast scrap	16.50 to 17.00
Old steel axles	21.00 to 21.50
Iron axles	26.00 to 26.50
Car wheels	19.00 to 19.50
Railroad malleable scrap	17.00 to 17.50
Machine shop turnings	12.00 to 12.50
Cast iron borings	9.50 to 10.00
Low phosphorus steel scrap	21.00 to 22.00
Old iron rails	20.00 to 21.00
Tank iron	14.00 to 14.50
Sheet iron	9.00 to 9.50
Stove plate	14.00 to 14.50
Pipe and flues	14.00 to 14.50
Grate bars	13.00 to 13.50
Boiler plate	15.50 to 16.00

ST. LOUIS.

Some Inquiries for Southern Iron Are Still Pending—Coke Inquiry Slow.

Dec. 28.

Pig Iron.—The inquiry in the St. Louis territory for 2,000 tons of southern gray iron, reported in the Daily of Dec. 24, is still pending, but may be closed this week. One sale of 600 tons of car wheel iron was made Saturday, and several sales of car load lots of various kinds of iron are reported to have been made last week. An inquiry is out for 300 tons of southern No. 1 for first half delivery. With these exceptions, the market is extremely quiet, and probably will remain so until after Jan. 1, when dealers believe a buying movement will begin, although there is no apparent stiffening in prices. One frequently hears of $14 being done for No. 2 southern in the St. Louis territory, for spot shipment, but this is just as frequently denied by others, who insist that the correct price is $14.50, and add that they cannot get any iron at the lower figure. Ohio iron is reported firm at $17 to $17.50, f. o. b. Ironton. Our quotations on southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow:

No. 1 foundry	$ 18.75
No. 2 foundry	18.25
No. 3 foundry	17.75
No. 4 southern	16.75 to 17.25

Coke.—Inquiries for coke are just about as slow coming in as they are for pig iron. Connellsville 72-hour foundry coke is quoted at $3.15 to $3.25, ovens, for immediate shipment, according to grades, and $3.15

to $3.50 for future delivery. Connellsville 48-hour furnace coke is firm at $2.75 to $3, ovens, for all shipments. Virginia 72-hour foundry coke is held at $3 to $3.25 for immediate delivery and shipment on contracts. Virginia 72-hour coke is offered at $3.25, and Virginia 48-hour at $2.50 to $3. The price on by-product coke, St. Louis, is $5.80.

Old Material.—There are very few transactions in scrap iron reported in the St. Louis market. The mills are not actively engaged, and while there seems to be a downward tendency in this industry, there is nothing tending to demoralization. Prices probably are 25 cents lower than they were last week. Our quotations follow:

Old car wheels	$17.00 to 17.50
Old iron rails	19.00 to 20.00
Rerolling rails (4 ft. and over)	16.75 to 17.25
Old steel rails (2 ft. and under)	16.50 to 17.00
Light section relayers, 45 lbs. and under, subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	24.50 to 25.00
Frogs, switches and guards	15.50 to 16.00
Heavy melting steel	15.50 to 16.00
Shoveling steel	14.00 to 14.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$14.50 to 15.00
No. 2 R. R. wrought	13.50 to 14.00
Arch bars and transoms	17.50 to 18.00
Knuckles, couplers and springs	15.00 to 15.50
Shafting	17.00 to 17.50
Iron car axles	20.00 to 21.00
Steel car axles	20.00 to 21.00
Locomotive tires	18.00 to 18.50
No. 1 country wrought	12.25 to 12.75
Pipes and flues	11.75 to 12.00
No. 1 cast, 150 lbs. and less	14.00 to 14.50
No. 1 busheling	13.00 to 13.50
No. 2 busheling	9.75 to 10.25
No. 1 boiler cut	11.50 to 12.00
Boiler purchings	13.00 to 14.00
Cast and mixed borings	7.50 to 8.00
Machine shop turnings	10.75 to 11.25
Railroad malleable	13.25 to 13.75
Agricultural malleable	11.50 to 12.00
Stove plate and light cast scrap	11.50 to 12.50
Angle bars, splices, etc. (iron)	17.25 to 17.75
Angle bars, steel	15.50 to 16.00

BIRMINGHAM, ALA.

Not Enough Pig Iron Business to Test the Market.

Dec. 27.

Pig Iron.—There is hardly sufficient business offered in this market to test the strength of quotations on any deliveries. The principal consideration during the week just ended were comparatively small lots for prompt shipment and prices received can hardly be considered a criterion of values. So far as is known, none of the furnace companies nor any of the iron merchants have offered prompt or first quarter shipments at lower figures than $14 per ton, Birmingham, for No. 2 foundry. There has been but little tonnage reported engaged so far for the first quarter at the figures just named. In the majority of cases, producers are rather indifferent as to sales at present prices, and quotations other than on bona fide inquiries are elicited with some reluctance. The largest concern in this district is entirely out of the market for the first half of next year and adheres strictly to a basis of $15 per ton, Birmingham, which is prohibitive. Other producers are known to be well supplied with orders against their production during the early months of the year, yet there is quite a difference of opinion as to the extent the foundry trade generally has been provided with raw material for 1910 consumption through purchases and deliveries effected during the present year. It is a fact that in a few cases among the producing interests there are reports of significant tonnages to be carried over, and stock yards show that the output has applied to orders in practically all cases, but there are no statistics as to the volume of business that has been placed with founders against their raw material provision and no comparison is offered of the tonnage actually required by founders' order books with the tonnage they have actually received in stock.

Cast Iron Pipe.—Material additions have been made to the order books of local producers within the past week by the placing of round tonnage contracts to cover municipal requirements in Texas cities. The prices being asked are not affected by the decline in price of pig iron and by reason of late additions to order books it is likely that an advance will soon be made. A number of inquiries are pending that promise to take definite form as soon as satisfactory financial arrangements are made and all capacity now in operation is producing tonnage already sold. Cast iron water pipe is quoted at an average price of $25 per net ton f. o. b. cars here, with $1 per ton extra for gas pipe.

BRITISH IRON MARKET.

More Animation in Pig Iron and Finished Lines Look Brighter.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Dec. 18.

Pig Iron.—There has been a marked improvement in tone in the pig iron market during the past week, and especially has this been manifest in the Birmingham district. On Thursday, in particular, there was more animation on the market than for some time past, especially in pig iron. Buyers have decided that a marked improvement is to be looked for early in the new year, and they have hastened to close contracts, in some instances for rather long periods. Generally speaking, makers of pig iron have withdrawn concessions recently offered by them to attempt business, and the laggards among buyers realize that they have waited a little too long. The strength of tone in the Middlesbrough market is the more remarkable, because no great amount of business is being done, and stocks are still rapidly increasing, the total now in store being 377,000 tons, an addition during the present month of 13,800 tons. This is not a good sign, but against this must be set the fact that stocks in makers' yards have been reducing considerably, so that Connal's stores represent the worst in this line that is to be said. There is considerable disappointment over the non-arrival of American business, but no doubt whatever is entertained that this will come along bye and bye. The shipments during the present month have been 41,593 tons, compared with 44,412 tons last month. Today's selling price is 50s 4d ($12.32) for No. 3. The hematite market is in a still stronger position in view of the marked improvement in demand for shipbuilding and most descriptions of steel. Everyone is looking forward to next year with great hopefulness. For East Coast mixed numbers the selling figure is 60s ($14.68), with 62s 6d ($15.00) for delivery during the next quarter. Coke still continues firm, and will help to maintain the market. Certain Derbyshire firms have announced a rise of 1s per ton for forge pig iron.

Finished Department.—The finished market generally shows a better tone. There is more structural business on offer than for a long time past. Hitherto, this department has been persistently depressed. The galvanized sheet trade shows a distinct upward movement, with plenty of home and foreign orders, and makers of tin plate are well off for work. The wire trade shows improvement, although for the present prices are not affected, but the brighter conditions have encouraged makers to contract largely for billets for their future requirements. The steel trade shows an improvement, one evidence of which is a rise of 5s in the price of steel angles. In the general steel trade, prices tend upwards, very decidedly, and the Midland mills are full of work. In the North of England, the improvement is not so marked.

METAL MARKETS.

ST. LOUIS.

Dec. 28.

Lead and Zinc.—The price of zinc ore dropped $2 in the Missouri-Kansas-Oklahoma district last week, selling at $49. A scarcity of freight cars probably caused the slump. But at this figure, ore was $19 higher than it was shortly before the new

tariff law was passed. Lead ore was firmer, selling at $56 and $57 a ton. Calamine was weaker at $26 and $27 a ton.

Up to this date the district breaks all previous records for output, with a total of 272,524 tons of zinc blende, 28,861 tons of calamine and 44,186 tons of lead ore. The nearest approach to this enormous output was the year 1907, when the zinc tonnage aggregated 286,587 tons, with a valuation of $12,521,522. Because of the lower prices paid for zinc ore in the early part of 1909, the total valuation for the year is slightly short of that for 1907. The actual valuation of blende ores was $11,503,099; of calamine, $689,671; lead, $2,420,878. A large part of the increase was due to new camps. The output was practically doubled by Miami, Ok., Carthage and Sarcoxie, Mo. The Miami camp is at the extreme southwestern portion of the district and marks the extension of operations in that direction. The other camps mark new development work in the northern and eastern ends of the district.

CHICAGO.

Dec. 28.

New Metals.—There is practically no change in the local metal market. Demand is of an indifferent nature and prices are sluggish. Such sales that are recorded cover immediate requirements, and prompt shipment is asked. Prices are without change, and we quote as follows:

Lake copper, carload lots, 13¾c to 14c; casting copper, 13⅜c to 13½c; smaller lots, ¼c to ¾c higher. Spelter, 6.15c to 6.25c; lead, desilverized, 4.65c to 4.70c, in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $8 list f. o. b. La Salle in car lots of 600-pound casks; pig tin, 34c to 34½c; Cookson's antimony, 10½c; other grades, 9¾c to 10¼c.

Old Metals.—In sympathy with iron and steel scrap conditions, old metals have strengthened because of weather conditions. Smelters are not inclined however to contract heavily at this time, being busy with inventory and otherwise closing up the year's business. An active market is predicted about February.

We quote, dealers' selling prices, as follows: Copper wire, 13¼c; heavy copper, 13¼c; light copper, 11½c; heavy red brass, 12½c; heavy yellow brass 10c; light brass, 7½c; No. 1 red brass borings, 10c; No. 1 yellow brass, borings, 8c; brass clippings, 9½c; tea lead, 3.85c; lead scrap, 4⅜c; zinc, 4⅞c; tin pipe, 32c; tin foil, 29c; pewter, 23c; electrotype plates, free from wood, 4½c; electrotype dross, 3¼c; stereotype plates, 5c; stereotype dross, 3½c; prime slab zinc dross, $78 per ton.

NEW YORK.

Dec. 28.

Business in the metal lines has been very quiet due to the holidays and followed by a very bad storm.

Copper.—Prices are higher, due to a better demand from Europe. Sales were made today at 13.62½c for electrolytic and some of the selling agents are not willing to book orders for a large tonnage at that figure. The lake market is not as strong, but from the principal selling agents, there is nothing to be had at under 14c. The domestic situation does not seem to improve rapidly, but the buying by sheet rollers is good. In the minds of many well versed on the situation the feeling is expressed that there will be a destinct improvement in the first quarter of 1910.

Pig Tin.—New high records, for this movement, are being made every day. The "syndicate" abroad has the available tin well in hand. This coupled with a demand equal to the supply makes a very firm market. Today tin was sold at 34c and there is very little to be had at that figure. It must be remembered that many new uses have sprung up for tin in the last few years. The automobile industry is taking more tin for bearing metals than most people realize.

Lead.—The market continues firm and prices are unchanged from last week. The principal producer is selling at 4.70c and the outsiders have no difficulty in getting 4.75c.

Spelter.—Prices are without change and for prompt delivery sellers are asking 6.30c.

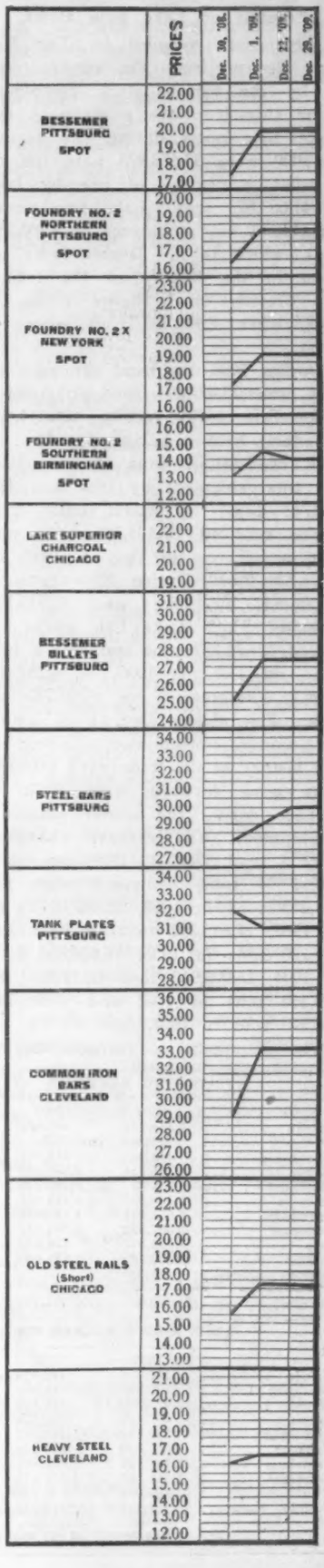
Antimony.—The market is quiet and prices are without change from last week.

ORE OPERATIONS RUSHED.

Arrangements are being made whereby the Forest of Dean mine, owned by the Hudson Iron Co., will be operated with three shifts, thereby increasing the daily output to about 320 tons. The mine is down about 2,000 feet on an 18 per cent grade, but the hanging wall is of such a nature that no timbering is required. Some additional equipment will be installed before the change to three shifts can be made.

The plant of the Conneaut Shovel Co., Conneaut, O., was badly damaged by fire Dec. 24, caused by the explosion of a watchman's lantern. The loss on the building and stock is estimated at $40,000.

PRICE CHART.



GREAT TONNAGE

Of Iron Ore Remains on Dock—Receipts at Lake Erie Ports.

The figures compiled by *The Marine Review* from the returns sent in by the various dock companies show that iron ore receipts at the Lake Erie ports during the season of 1909 were 33,672,825 tons, out of a total movement of ore by lake of 41,683,873 tons. Lake Erie docks on Dec. 1 held a balance of 8,965,789 tons, which is the largest store on hand in the history of the traffic, the previous high figure being in 1908, when 8,441,533 tons were on hand.

During 1908, the total shipment by lake was 25,427,094 tons, of which Lake Erie docks received 20,414,491 tons and held a balance on Dec. 1, 1908, of 8,441,533 tons. During 1907 the total shipment by lake was 41,288,755 tons, of which Lake Erie docks received 35,195,758 tons and held a balance on Dec. 1, 1907, of 7,385,728 tons. During 1906 the total shipment by lake was 37,513,595 tons, of which Lake Erie docks received 32,076,757 tons and held a balance on Dec. 1, 1906, of 6,252,455 tons. The reserve of 8,965,789 on Lake Erie docks Dec. 1 is ample for winter consumption. Never in the history of the trade have 5,000,000 tons gone forward from dock to furnace during the winter season.

Shipments to furnaces between May 1, and Dec. 1, 1909, aggregate 30,077,304 tons, compared with 17,453,258 tons in 1908, 29,787,018 tons in 1907, 27,615,392 tons in 1906, 24,311,720 tons in 1905, 16,658,806 tons in 1904, 16,903,013 tons in 1903, 18,423,364 tons in 1902 and with 14,204,596 tons in 1901.

The shipments to furnaces during the season of navigation as referred to are determined in this way: First we have the amount of ore on Lake Erie docks before the opening of navigation, May 1 last, 5,370,268 tons; add to this the receipts of the season just closed, 33,672,825 tons, and the total is 39,043,093 tons; deduct the amount on dock Dec. 1, 8,965,789 tons, and we have 30,077,304 tons as the amount that was forwarded either direct or from dock to furnace yards. It is, of course, understood that the difference between the total output of 41,683,873 tons which was shipped from the Lake Superior mines during 1909, and the receipts of 33,672,825 tons at Lake Erie ports, is ore that went to places other than Lake Erie ports, such as the furnaces at Lake Michigan ports. The accompanying table shows receipts at Lake Erie ports and amounts on dock during six years past.

WILL SELL PROPERTY.

The property of the Solid Steel Casting Co., Chester, Pa., will be sold at public sale by the receiver, William B. Harvey, on Jan. 11, at 2 p. m. The property to be sold includes the land, foundry, machine shop and other buildings, and the machinery and fixtures. A mortgage for $100,000, given Luther S. Bent, by the Solid Steel Casting Co., and an arbitrator's award for $1,000 against the Solid Steel Casting Co. will not be divested from the property by the sale.

The rebuilding of the Secaucus furnace of the Hudson Iron Co., located within sight of New York City, is proceeding slowly and it will be well along in the spring before the production of iron can be resumed.

IRON ORE RECEIPTS AT LAKE ERIE PORTS GROSS TONS.

	1909	1908	1907	1906	1905	1904
Toledo	1,374,224	680,553	1,314,140	1,423,741	1,006,835	508 792
Sandusky	11,088	.....	83,043	35,847	51,202	48,356
Huron	243,082	213,377	971,430	778,453	825,278	231,364
Lorain	2,796,856	2,286,388	2,621,025	2,191,965	1,605,823	972,931
Cleveland	6,051,342	4,240,816	6,493,998	6 604,661	5,854,745	3,572,228
Fairport	1,734,277	1,518,961	2,437,649	1,861,498	2,008,621	1,157 858
Ashtabula	8,056,941	3,012,064	7,521,859	6 833,352	6,373,779	3,639,250
Conneaut	7,007,834	4,798,631	5,875,937	5,432,370	5,327,552	4,083 655
Erie	1,235,057	828,602	2,294,239	1,986 539	2,112,476	1,284,778
Buffalo	5,002,235	2,835,699	5,580,438	4,928,331	3,774,928	2,433,601
Detroit	159,889	.....	.....	.....	.....	.....
Total	33,672,825	20,414,491	35,195,758	32,076,757	28,941,259	17,932,814

IRON ORE ON LAKE ERIE DOCKS, DEC. 1, GROSS TONS.

	1909	1908	1907	1906	1905	1904
Toledo	332,456	590,923	518,645	281,000	368,024	318,573
Sandusky	39,557	36,079	44,546	17,467	52,977	75,134
Huron	477,333	458,158	415,730	245,499	208,023	182,495
Lorain	407,129	426,274	366,271	336,321	271,695	299,504
Cleveland	1 547,142	1,458,392	1,281,335	1,224,606	1,330,619	1,237,033
Fairport	867,640	835,821	523,981	590,783	759,961	660,420
Ashtabula	2,594,359	2,293,531	2 056,820	1,631,312	1,589,951	1,403,575
Conneaut	1,411,002	1,296,675	1,090,774	1,057,424	976,976	684,487
Erie	788,046	730,530	652,219	552,631	564,961	583,439
Buffalo	501,125	315 148	435,407	315,412	315,780	318,739
Total	8,965,789	8,441,533	7,385,728	6,252,455	6,438,967	5,763,399

BUFFALO PROPERTIES

Will be Merged Into Rogers-Brown Iron Co.—Two More Stacks.

The Rogers-Brown Iron Co. has been organized with a capital of $5,000,000 to build a blast furnace plant at Buffalo and take over the Buffalo & Susquehanna Iron Co. of Buffalo, which now operates two blast furnace there. Incorporation papers have been filed at Albany and the new company will proceed at once to carry out its purposes, which include building two blast furnaces on the ground of the South Buffalo Canal & Dock Co., adjoining the Buffalo & Susquehanna Iron Co's plant. This site is at the Buffalo city line. It touches the Hamburg turnpike and has a frontage of 1,000 feet on the Union Ship Canal and will be reached by the largest lake boats through the south harbor entrance of the Lackawanna Steel Co. Drilling for foundations for the two furnaces has been begun. It is understood that the furnaces will in essential features duplicate those of the Buffalo & Susquehanna Iron Co. The property upon which the plant will be built comprises 82 2/5 acres. The Rogers-Brown Iron Co., with the two proposed furnaces and those acquired through merger of the Buffalo & Susquehanna Iron Co., will have a production capacity of from 1,200 to 1,500 tons a day, including all grades of foundry iron, Bessemer, basic and malleable. The new plant will be equipped with pig casting machinery.

The new company will also acquire by purchase and merger all the ore properties of the Buffalo & Susquehanna Iron Co., in Michigan and Minnesota and the mine and coke oven operations in Pennsylvania. The company will then have five important ore properties in Michigan and the Susquehanna mine on the Mesabi range, the latter being estimated to contain 26,000,000 tons of ore, both Bessemer and non-Bessemer, most of which may be mined with steam shovels when surface is removed.

The officers of the Rogers-Brown Iron .Co. are: President, William A. Rogers; vice president, Stephen M. Clement; second vice president and general manager, Hugh Kennedy; secretary, H. D. Carson; treasurer, William T. Shepard. The directors include all of the above mentioned except the secretary. Charles W. Goodyear, president of the Buffalo & Susquehanna railroad, is also a director.

EIGHT-HOUR DAY

FALLACY EXPOSED BY UNITED METAL TRADES ASSO'N.

Pacific Coast Foremen's Second Annual Banquet Proved Most Interesting and Profitable.

The second annual dinner given by the members of the Oregon district of the United Metal Trades Association of the Pacific coast, in honor of their foremen, was held at the Commercial Club, Portland, Ore., Dec. 18. In addition to the foremen a number of out-of-town guests from the Puget sound district were present.

The toastmaster was O. E. Heintz, president of the United Metal Trades Association and manager of the Pacific Iron Works, Portland.

H. S. Hastings, ex-commissioner of the Metal Trades Association, and at present manager of the Independent Foundry Co., in a brief speech reviewed the success of the association and the foremen's organization. The advantages to be derived from free social intercourse among those interested in the metal trades were emphasized by the speaker.

C. E. Mack, president of the Portland Foremen's Association, made the principal address in behalf of the guests of the evening. Mr. Mack reviewed the history of the Portland Foremen's Association. He said that after a period devoted to talk and inaction the organization was finally perfected with only 21 members at first. The membership since that time has increased at the rate of five new members per month. At first, said Mr. Mack, it was difficult to provoke free discussion on the floor of the meetings, but later this apologetic spirit wore off and the members found that they were obtaining training not only in craftsmanship but in self expression as well.

In a witty speech, C. E. Grella, president of the Independent Foundry Co., responded to the toast, "In Defense of the Dutch." Conditions in the metal working shops of Portland 35 years ago were outlined by Reuben Straus. Morton H. Insley, secretary of the Willamette Iron & Steel Works, followed with humorous remarks. Arthur P. Prier, of the Oregon Brass Works, paid his compliments to the foremen and to the spirit which makes such a gathering possible.

"You foremen are the bone and sinew of our business," was the opening remark of William H. Corbett, president of the Willamette Iron & Steel Works. He pointed out clearly the helpless condition of the employer who does not enjoy the full confidence and co-operation of his foremen. In a picturesque manner he then reviewed his impressions on first coming to the Pacific coast ten years ago. He found conditions quite the reverse of his expectations; the plants were inadequate in physical equipment and laid out with little regard for economical manufacture or accurate workmanship, but nevertheless were able to produce some splendid specimens of machinery. He discovered a peculiar condition of local competition which, although rapidly passing, exists to some extent on the Pacific coast to this day. He declared that in spite of the growth of eastern competition there is an opportunity for the development of clean manufacturing enterprises in the west, and the success of these enterprises will be measured largely by the efficiency of the work done in the shop, for which the foremen are directly responsible.

"The eight-hour day," he declared, "would sound the death knell of manufacturing on the Pacific coast. Our big plants would degenerate into nothing but large jobbing shops. Our hopes for manufacturing, for stability and growth would be gone. We are working now on a very narrow margin. A complete logging engine can be shipped here from the east for $1.40 per 100 pounds, while we are forced to pay from 75 cents to $1.25 for our raw material, which must be afterwards cut and reduced to size, making the net freight on the raw materials in a finished engine considerably higher. We realize that shorter hours and higher wages exist in the building trades, but the conditions in the building trades and the iron trades are not parallel. A new building can not be constructed by cheap labor elsewhere and shipped into Portland; an engine or a piece of machinery can. We like our men, we appreciate their problems and we beg their co-operation in building up manufacturing industries on the Pacific coast." Mr. Corbett's remarks were greeted with enthusiastic applause.

In a brief speech, Mr. Corbett's sentiments were seconded and amplified by Herman W. Smith, of the Smith & Watson Iron Works. Samuel Morrow, president of the Phoenix Iron Works, Portland, pointed out the judicial position of the foreman, who is responsible alike to his employer and to the men under him. Wm. Varney, of the Willamette Iron & Steel Works, speaking on behalf of the foremen, stated that they fully appreciated the employers' problems on the Pacific coast and the efforts which had been made through the Metal Trades Association to draw the employers and the workmen together. F. C. Porter, secretary of the United Metal Trades Association, pointed out the relation of the Employers' Association to the foremen's organization.

DEATH OF NELSON E. WHITAKER.

Pittsburg, Dec. 29. (By wire.)

Nelson E. Whitaker, president of the Whitaker-Glessner Co., Wheeling, W. Va., a prominent iron and steel manufacturer, died at Wheeling, Dec. 28. In addition to his connection with the Whitaker-Glessner Co., which embraces sheet and tin mills and a corrugating plant at Wheeling and the old Laughlin mill at Martins Ferry, O., he was largely interested in the La Belle Iron Works, Steubenville, and the Tyler Tube Co., Washington, Pa. Mr. Whitaker was also prominently identified with the Portsmouth Steel Co., at Portsmouth, O. He was active in Republican politics and at one time served in the West Virginia state senate. He was chairman of the West Virginia commission to the Louisiana Purchase Exposition.

Had a Home-Coming.—The Columbia Tool Steel Co. had a home-coming of salesmen at Chicago Heights and at Chicago Dec. 28 and 29. The salesmen were all at the mill on the 28th where lunch was served, and in the evening they were tendered a banquet at the Chicago Athletic Club by Frank Matthiessen, vice president of the company, covers being laid for eighteen. An interesting souvenir was presented to each of the salesmen by E. T. Clarage, president of the company, who acted as toast master. It is planned to make this home-coming and dinner an annual event.

The F. H. Niles Car Co., Chicago, has increased its capital from $50,000 to $500,000, and changed its name to the Blue Island Rolling Mill & Car Co.

The Bridgeport Forge Co., Bridgeport, Conn., has filed a certificate of increase of capital stock from $150,000 to $200,000.

Price McKinney, of Corrigan, McKinney & Co., Cleveland, started Monday night on a trip to Mexico.

WELL EQUIPPED PLANT

Will be Occupied by the Garry Iron & Steel Co. at Youngstown.

The Garry Iron & Steel Co., Cleveland, which manufactures conductor pipe and eaves trough, the various forms of metal roofing and siding, expanded metal lath, dry paints and mortar colors, and is a heavy jobber in flat sheets and tin plate, has for several years past been one of the largest buyers of sheets in the country. To better enable it to take care of its increasing requirements in this line, the company has decided to build a plant at Youngstown, O., with six hot mills, including a tin mill for rolling sheets of the lighter gages. Provision will also be made for the production of pure iron sheets.

In addition to a tract of 10 acres of land along Crab Creek and adjoining the right of way of the New York Central lines in Youngstown, on which the rolling mill will be erected, the Garry company has purchased the George B. Sennett plant, latterly used by the Harris Safety Co., and the Reliance Edge Tool Co.'s plant, adjoining the first named property, thus providing commodious and suitable quarters for its present manufacturing business, which will be removed to Youngstown some time prior to July 1, next. Not only will the rolling mill itself be the best and most modern that brains, capital and experience can provide, but the same policy will be observed in equipping with new machinery the conductor pipe and roofing shop, so as to produce the best possible article at a minimum cost.

The present authorized capital stock of the company is $300,000, which, to finance the proposed extensions and improvements, will be increased to $700,000, of which $500,000 will be common and $200,000 preferred, all of which it is expected will be subscribed for by the present stockholders. The contract for the erection of the steel structure for the rolling mill has been awarded to the McClintic-Marshall Construction Co., and for the mill equipment, to the United Engineering & Foundry Co., work on both contracts to begin at once.

The Garry company will, of course, later have its general offices at Youngstown, but will maintain a branch office and warehouse at Cleveland, carrying there a liberal stock of the same lines it now handles and making even more prompt deliveries, if possible, than heretofore, because of its greatly improved facilities. The officers of the company are:

President, George D. Wick, Youngstown; vice president and treasurer, Samuel Siddall, Cleveland; assistant treasurer, Philip Wick, Youngstown; secretary and manager of sales, J. Charles Wicks, Cleveland.

In addition to the two gentlemen first named, Henry Wick, Frank Hitchcock and Porter Pollock, all of Youngstown, are directors.

ORE MINES

Filled With Water—Alabama Furnaces Banked.

The ore mines of the Sloss-Sheffield Steel & Iron Co., at Bessemer, Ala., have filled with water to such an extent that operations have been suspended. By reason of this, the Sloss company has blown out one furnace each at the North Birmingham and City plants, to be relined while there is a shortage of ore. The furnaces of the Sloss company at Sheffield, Ala., that have been banked for some days on account of severe weather will be put back in operation about Jan. 1.

NAMED FIRST ASSISTANT.

J. Leon Replogle has been appointed assistant to General Manager Charles S. Price, of the Cambria Steel Co., succeeding Herbert H. Weaver, who will retire Jan. 1. The appointment of Mr. Replogle as first assistant will remain in force until March 1, when Mr. Price will assume the presidency of the company; it being expected that other changes will then be made, including the appointment of a general manager and his assistant. The appointment of Mr. Replogle comes as the result of years of faithful performance of duties with the Cambria Steel Co., he having entered the employ of the company when 13 years old as officeboy, later becoming clerk, shipper, assistant to the superintendent of the forge, axle and bolt department, then superintendent and finally general superintendent of the order department, from which office he has just been promoted.

CARRY ITS OWN RISKS.

The Colorado Fuel & Iron Co. has announced that hereafter it will carry its own insurance, which, under the general form amounts to $650,000 on buildings and $1,000,000 on stock, etc. For years the risk was covered by cut rates through Lloyd's, London. Recent proposal of the Rocky Mountain board of underwriters to charge a straight rate, whereas a competitive rate had been in force for five years, caused the company to refuse to accept it.

NEW CLASSIFICATION

Of Wrought Pipe List Made by National Tube Co.—Errors Corrected.

The National Tube Co. has issued the new classification of its wrought pipe list, correcting some of the present inequalities of the schedule and the revised card will become effective Jan. 1. The company has made the following statement relative to the changes:

The change in pipe list is made to fit present conditions and to correct some errors which have developed in the old list. Heretofore public quotations have been based upon catch weights known as "merchant weight." Hereafter such quotations will be based upon "card weight," hence change in the card, which, however, carries the same trimmings to jobbers as formerly pertained to "merchant weight." "Merchant weight" will still be furnished in black and galvanized ⅛ inch to 6 inch only when specified, and will be sold to jobbers at the usual concession on "card weight" prices. The net result leaves the net price of pipe just about the same as heretofore.

The new card weight list of discounts, which is subject to the usual weight variation of 5 per cent, is as follows:

WROUGHT PIPE.

Steel.

	Car loads		Less car loads	
	Black	Galv.	Black	Galv.
⅛ inch and ¼ inch.	70	54	68	52
⅜ inch	71	57	69	55
½ inch	74	62	72	60
¾ inch to 6 inch..	78	68	76	66
7 inch to 12 inch..	72	57	70	55
13 inch to 15 inch..	51½	..	47	..
Plugged and reamed:				
1 inch to 4 inch..	76	66	74	64
Extra strong plain ends:				
⅛ inch to ¾ inch..	63	51	61	49
½ inch to 4 inch..	70	58	68	56
4½ inch to 8 inch.	66	54	64	52
9 inch, 10 inch, 11 inch, and 12 inch.	59	47	57	45
Double extra strong plain ends:				
½ inch to 8 inch..	59	48	57	46

WROUGHT CASING.

	2 inch to 3 inch.	3¼ inch to 4 inch.	4¼ inch to 9⅝ inch	10⅝ inch to 12½ inch	13½ inch to 15⅝ inch.
Jobbers car loads:					
S. & S. Random Length	62	66	70	65	47½
I. J. Random Length	58	60	65½	61½	..
S. & S Cut Length	58	60	65½	61½	..
I. J. Cut Length	53½	56	61½	57½	..
Consumers Car loads:					
S. & S. Random Length	60	64	68	63	45½
I. J. Random Length	55½	58	63½	59½	..
S. & S. Cut Length	55½	58	63½	59½	..
I. J. Cut Length	51	54	59	55½	..

LARGE O. D. WROUGHT PIPE.

Random lengths plain ends	Jobbers car loads	Consumers car loads
14 inch to 20 inch O. D.....	60	55
21 inch to 24 inch O. D.....	55	50
26 inch to 30 inch O. D.....	50	45

SERIOUS PROBLEMS

Being Faced by Vessel Owners—Meeting of Protective Association.

Lake vessel interests are settling up their affairs for 1909 and will in all likelihood map out the program for 1910 during the coming month. With ore prices, both for Bessemer and non-Bessemer, substantially advanced, an increase in the freight rate will doubtless follow. Shippers will probably cover their tonnage requirements during the first week in January. Nothing more clearly bespeaks the return of prosperity than this.

Meanwhile vessel owners are facing serious problems in connection with their business. The Great Lakes Protective Association, which was organized at the last annual meeting of the Lake Carriers' Association, will meet in Detroit on Jan. 18 and 19, immediately preceding the meeting of the Lake Carriers' Association. The Great Lakes Protective Association was organized to carry out the plan of inter-insurance under which vessel owners carry a part of their own insurance. Its purpose fundamentally, however, was to make for safer navigation and to minimize through care the number of accidents which have made the insurance business so unprofitable on the lakes. Marine insurance on the lakes during 1909 aggregated $80,000,000, of which vessel owners carried 5 per cent, or $4,000,000. Accidents, however, have been numerous and costly and while no figures are obtainable, it is understood that the insurance companies have made no money and that they contemplate imposing further restrictions upon the trade for 1910. It is understood, for instance, that no more excess insurance will be written, and it may be that the season of regular insurance will be limited to November. That the business is regarded as extremely hazardous is proved by the fact that several of the leading companies have withdrawn from the trade and that the premiums equal 10 per cent of the capital stock of some of the companies operating single vessels. This is, of course, a practically prohibitive rate for a small vessel.

Some of the leading owners, notably the Pittsburg Steamship Co. and Pickands, Mather & Co., have already signed with their engineers for 1910, thus obviating any possible trouble with the Marine Engineers' Beneficial Association. No advance in wages of engineers on first class steamers is contemplated, but it is likely that chief engineers on second class steamers will be granted an increase.

One of the three steamers now building for the Pittsburg Steamship Co. at the Ecorse yard of the Great Lakes Engineering Works will be constructed on the Isherwood or longitudinal system of construction. She will be classified by Lloyds, who will send one of their surveyors to supervise her construction.

The car ferry Ashtabula, which was stranded at Port Burwell, has been delivered at Cleveland for repairs.

The statement of lake commerce through the canals at Sault Ste. Marie for the season of 1909 has just been issued by Col. C. McD. Townsend. The total commerce for 1909 was 57,895,149 net tons, as against 41,309,557 tons for 1908, an increase of 40 per cent. The 1909 movement comes within 322,065 tons of equaling the 1907 movement, when 58,217,214 tons were moved. During December, 1,791,349 tons were moved through the canals.

The United States canal was opened April 20 and closed Dec. 11, a season of 236 days. The Canadian canal was opened April 21 and closed Dec. 16, a season of 240 days.

NEW YORK ORE RECEIPTS.

According to present arrangements, it is understood that fully 15 cargoes of iron ore will be received at the port of New York during January. Inasmuch as this will all have to be unloaded at the terminals of the Lackawanna and Central of New Jersey, demurrage is likely to accrue, and some of the vessels may have to be diverted to Perth Amboy or other unloading points. These shipments are practically all Spanish ore.

Foreign advices are that, alarmed at the activity of American furnacemen in purchasing Swedish ore, German iron makers have entered the market and taken on large tonnages at an advance.

The International Nickel Co. has declared the regular quarterly dividend of 1½ per cent on its preferred stock, and 1 per cent and an extra dividend of one-half of 1 per cent on its common stock. The preferred dividend is payable Feb. 1, and the common dividends are payable March 1.

The Youngstown Sheet & Tube Co., Youngstown, O., has declared the regular quarterly dividend of 2 per cent.

LIABILITY INSURANCE

Will be Assumed by Youngstown Sheet & Tube Co.

The Youngstown Sheet & Tube Co., it was announced at a recent meeting of the directors, will assume its own liability insurance the coming year. A plan whereby the company will recompense employes without litigation for injuries which they may sustain, or their estates for deaths which may occur in the performance of duties, is being developed.

After approving President Campbell's recommendations, the board referred them back to the management with instructions to work out the final details. It is proposed, in brief, to establish a fixed amount to be paid surviving heirs for all deaths while in the employ of the company, and also a fixed rate to be paid each injured person, this depending upon the nature of the injury. Rates will be fixed by the management of the plant, but while the rate will be a minimum one, yet payment will be made in each case regardless of contributory negligence on the part of employes.

J. B. LAUGHLIN RESIGNS.

J. B. Laughlin has resigned as treasurer of the Jones & Laughlin Steel Co. to be succeeded by Charles A. Fisher, at present assistant auditor and assistant treasurer. The resignation of Mr. Laughlin, which has been contemplated for some time, will take effect Jan. 1. He has been actively identified with the affairs of the company for more than 25 years and has for some time desired to be relieved of the confinement of active office work. He continues with the company as a director and member of the executive committee. Mr. Laughlin is a son of H. A. Laughlin, a director and member of the executive committee, and a grandson of the late James Laughlin, who with the late B. F. Jones Sr. founded the firm. Mr. Laughlin, accompanied by his wife and daughter, will sail on Jan. 8 for the south of France to spend the winter.

A state charter has been issued to the Clearfield Rolling Mill Co., of Clearfield, with $5,000 capital. The company will make various kinds of rolled products, according to the charter statement. The incorporators are H. H. Straw, A. W. Lee and S. C. Sherman.

The Cincinnati Horseshoe & Iron Co. has declared an initial dividend of 10 per cent, payable 2½ per cent quarterly.

DEATH OF JAMES W. FRIEND.

James W. Friend, president of the Clinton Iron & Steel Co., Pittsburg, vice president of the Pressed Steel Car Co., and widely known as an iron master and business man of the Pittsburg industrial center, died at Pittsburg, Dec. 26, aged 65 years. He had been ill for some time and his death was not unexpected. Mr. Friend's life was an example of determination and perseverance. Early in youth, the heavy responsibility devolved upon him of rescuing a part of the family estate from bankruptcy, and this was the beginning of his business activities which at his death officially identify him with large industrial and financial enterprises. His grandfather, the late James Wood, one of the first practical iron and steel workers of Pittsburg, had operated an iron plant at Saw Mill Run, and when at his death the business went into bankruptcy, young Friend was called to his mother's aid to save a portion of the estate, which he accomplished. Later he entered into the iron brokerage business and was very successful. In 1886, when the firm of Graff, Bennett & Co. became bankrupt, the South Side plant, known as the Clinton furnace, was acquired by Mr. Friend and F. N. Hoffstot, and the plant has been operated ever since under his management. In 1900, Messrs. Friend and Hoffstot purchased the steel car plant of C. T. Schoen, at McKees Rocks, Pa., and organized the Pressed Steel Car Co., of which Mr. Hoffstot became president and Mr. Friend vice president. In addition to his iron and steel interests, Mr. Friend was connected in executive capacities with a number of Pittsburg banks. He was also prominent in club life. Mr. Friend was a native of Pittsburg. In his immediate family he is survived by a widow and four children, of whom Chas. W. and Theodore W. are connected with the Clinton Iron & Steel Co., in the capacities of vice president and furnace superintendent, and treasurer and general sales agent, respectively.

OBITUARY.

Christian Shively, aged 64, general superintendent of the Dilworth, Porter & Co., Ltd., Pittsburg, died at Pittsburg recently. He had been formerly connected in an operating capacity with the Jones & Laughlin Steel Co.

Arthur Brock, identified for years with the steel industry, and prominent in financial and social circles of Philadelphia, died at his home in that city, Dec. 24, aged 59. He had been ill for several weeks with pneumonia. Mr. Brock was chairman of the board of the American Iron & Steel Mfg. Co., a director in the Pennsylvania Steel Co., and also in the Fidelity Trust Co., Philadelphia.

William Clark Magee, age 54, a prominent figure in the coke industry, died at Pittsburg, Dec. 26, after a lingering illness. Mr. Magee was president of the Consolidated Connellsville Coke Co. at the time of his death. He began his activity in the coke industry in 1880, when he became general agent for the Schoonmaker Coke Co., of Pittsburg. He remained with that company until 1888, when he was made general sales agent of the H. C. Frick Coke Co. Mr. Magee was connected with that company until 1903, when the various coke interests of the United States Steel Corporaiton were consolidated. Previous to that time, he had been made vice president of the H. C. Frick Coke Co.

John A. J. Shultz, president of the Missouri Manufacturers' Association, died of apoplexy at his home, 4407 Washington avenue, St. Louis, Dec. 24, aged 71. He was the head of the Shultz Belting Co., and had been a resident of St. Louis 45 years. He was born in Grantsville, Md., received his education there, and became associated with his father in the tanning business. Mrs. Shultz was stricken Christmas eve a year ago, and died two weeks later. Soon after moving to St. Louis, Mr. Shultz became associated with C. W. Ford in the tanning business, and established the Shultz Belting Co in 1877.

PERSONAL.

Ward W. Jacobs, of Hartford, Conn., has been chosen president of the Shelby Iron Co. in succession to Capt. T. G. Bush, deceased.

Frederic Nicholls, head of the Canada Foundry Co., and other extensive industries, has left for England, where his son, H. G. Nicholls, has undergone an operation for appendicitis.

John J. Spearman, the veteran iron maker of Sharon, Pa., recently celebrated his eighty-fifth birthday. Mr. Spearman is enjoying excellent health for a man of his advanced years.

G. H. Brusie, of Manistique, Wis., has been appointed general superintendent of the Manistique, Chocolay and Newberry furnaces of the Lake Superior Iron & Chemical Co.

George D. Evans, who has been at his old home in Cleveland for a number of months on account of ill health, has resumed his duties in the Denver office of the Carnegie Steel Co.

J. H. McKowen, who has been connected with the sales organization of the rail and billet division of the Carnegie Steel Co., at Pittsburg, has been transferred to the St. Louis district office of the company, effective Jan. 1.

J. N. Cross, for 17 years associated with the Bay View mills of the Illinois Steel Co., has resigned to become superintendent of the punch and press department of the A. O. Smith Co., manufacturer of pressed steel automobile frames. The Smith company is building a $500,000 plant in Milwaukee, which will be ready soon.

Thomas Mott Lewry Jr., for some time connected with the Republic Iron & Steel Co., in its New York office, has become associated with the firm of Crocker Bros., 99 John street, New York.

E. C. Felton, president of the Pennsylvania Steel Co., is in Cuba in connection with the ore developments of the Spanish-American Iron Co., but will return toward the end of the week.

Walter Loring Webb, C. E., announces that he has become associated with the Roberts-Abbott Co., Inc., consulting, supervising and operating engineer, Cleveland. Mr. Webb will represent the company in Philadelphia and its vicinity, with offices at 1026-28 Real Estate Trust building, Philadelphia.

R. P. Hutchinson, for the past three years connected with the Philadelphia office of the Carnegie Steel Co., has been transferred to the Cleveland office of that company. Before going to Philadelphia, Mr. Hutchinson was connected with the metallurgical department of the Carnegie company, at Pittsburg, following a period of service in the mills at Duquesne.

J. Reed Evans, auditor of ahe Crucible Steel Co. of America, has been elected secretary of the Sharon Steel Hoop Co., to succeed R. A. Winterburn, resigned. Jas. P. Whitla, of Sharon, has been chosen a director of the company to fill the vacancy caused by the death of Morris Bachman.

W. A. Keirn, advertising manager of the Mesta Machine Co., Pittsburg, has succeeded to the office of Purchasing Agent Frank L. Thompson, who has resigned to become associated with the Keystone Sheet Metal Co., Economy, Pa. Mr. Keirn will be in charge of the work of both the purchasing and advertising departments.

Cecil A. Robinson, district manager of the American Sheet & Tin Plate Co., in the Wheeling district, has tendered his resignation, effective Jan. 1. He is planning an extensive period of travel in this country and Europe. Mr. Robinson entered the iron business with the Aetna Nail & Iron Co., at Bridgeport, O., now the Aetna-Standard plant of the American Sheet & Tin Plate Co., about 35 years ago. He assisted in organizing the American Tin Plate Co. and served as one of its directors, becoming district manager of the Wheeling district when the combination of the American Sheet Steel Co. and the American Tin Plate Co. was effected in 1904.

Stock Exchange Has Dull Week

The New York stock market was inactive throughout the week, and prices moved within a narrow range except for a few issues. Money was firmer and advanced fractionally. Sterling exchange eased off, and the apprehension of gold shipments proved unfounded.

Monday, the market was dull and irregular, prices averaging lower. Sterling exchange was steady, and $1,500,000 in gold was withdrawn from the sub-treasury for export to Argentina. Tuesday was extremely dull, with prices still tending lower. Money advanced to 5½ per cent. Sterling exchange was easier. Crucible Steel common reached the highest price of the last six years on the Pittsburg market. The annual report by the Interstate Commerce Commission showed that the gross earnings of the railroads for the year ending June 30, increased $21,770,128, compared with the year ending June 30, 1908, while the net earnings increased $93,473,970. Wednesday, the market continued dull, with industrial stocks somewhat stronger. Thursday, Reading second preferred, advanced from 104½ to 117¼ on a rumor that the stock was to be retired. Steel common was lower. Friday, Reading declined rapidly, reaching 106. The general market was dull, but firm. The banks reported an actual surplus reserve of $3,751,000. Saturday, holiday.

Money on call throughout the week ranged from 5½ per cent to 2½ per cent, with most of the loans at 5¼ per cent. The actual report of clearing house banks showed surplus increased $3,616,000; loans decreased $14,902,800, deposits decreased $15,695,600, and the ratio of reserve 25.92, against 25.62 the week before. Trust companies and non-member banks reported loans and investments increased $12,034,000; deposits increased $13,656,100, and the percentage of reserve 16.7, against 17 the week before. Exports of gold for the week as reported at the custom house were $1,389,550, against imports of $49,230. Exports of gold for the year were $95,029,667, against $54,901,565 for the same period last year. The world's production of gold for 1908, as estimated at the Bureau of the Mint, was given out as 21,378,480 fine ounces, of the value of $441,932,200. Of this sum, the United States produced $94,560,000. The number of shares dealt in on the New York exchange was 2,904,600, against 3,751,600 the preceding week, and 4,618,159 the corresponding week last year. Railway and miscellaneous bonds were dealt in to the value of $15,910,000, against $25,039,000 the preceding week, and $36,992,000 the corresponding week the year before.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. Dec. 24	Changes in week	Date 1909 Ann.	M't'g.	Stock Outstanding	Dividend Basis	Dividend Last Declared	Dividend Date Last Div. Pay.
Allis-Chalmers	15	— ⅝	Sept.	2	$19,820,000		.....	.....
Allis-Chalmers, pr.	55	.....			16,150,000	7 cum.	1¾ Q.	Feb., 1904
American Can	13¼	—1	Feb.	2	41,233,300		.....	.....
American Can, pr.	81⅛	— ⅞			41,233,300	7 cum.	1¾ Q.	Jan., 1910
Am. Car & Fdy.	71½	—1	June	24	30,000,000		½ Q.	Jan., 1910
Am. Car & Fdy., pr.	120	+1			30,000,000	7 n. c.	1¾ Q.	Jan., 1910
American Loc.	59⅞	—1⅛	Oct.	19	25,000,000	5	1¼ Q.	Aug., 1908
American Loc., pr.	115	+1			25,000,000	7 cum.	1¾ Q.	Oct., 1909
American Ship.	78¼	+1¼	Oct.	13	7,600,000	4	1 Q.	Oct., 1908
American Ship, pr.	110¾	.....			7,900,000	7 cum.	1¾ Q.	Sept., 1909
Am. Steel Foundries(new)	65	.....	Dec.	2	17,184,000		1¾ Q.	.....
Barney & Smith	40	.....	June	1	2,000,000	4	.....	Sept., 1907
Barney & Smith, pr.	115	.....			2,500,000	8 cum.	1 Q.	June, 1908
Bethlehem Steel	33¾	— ¾	April	6	14,862,000		.....	.....
Bethlehem Steel, pr.	68½	.....			14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	49¼	+1	Mar.	16	45,000,000*	3	¾ Q.	Aug., 1909
Cambria Iron	47	+ ½			8,468,000*	4	2 S. A.	Sept., 1909
Chicago Pneumatic Tool	41½	+2⅜	Feb.	15	6,145,000	4	2 S. A.	Oct., 1907
Colorado Fuel	50¼	—1¼	Oct.	18	34,235,500		1¾ Q.	April, 1902
Crucible Steel	18	+2	Oct.	20	24,578,400		3½	.....
Crucible Steel, pr.	93½	+ ½			24,436,000	7 cum.	1¾ Q.	Dec., 1909
Empire Steel	13	+1	April	27	1,254,770		.....	.....
Empire Steel, pr.	75	.....			2,500,000	6 cum.	3 S. A.	July, 1909
Fay & Egan	90	.....	Feb.	18	1,000,000	7	3 S. A.	Nov., 1908
Fay & Egan, pr.	120	.....			1,000,000	7 cum.	1¾ Q.	Nov., 1909
General Electric	159½	— ⅛	May	11	65,179,600	8	2 Q.	Jan., 1910
Harbison-Walker	36	.....	Jan.	18	18,000,000		2 Q.	Oct., 1907
Harbison-Walker, pr.	95	.....			9,600,000	6 cum.	1½	Oct., 1909
International Pump	52⅝	+1⅞	June	8	17,762,500		1 Q.	April, 1905
International Pump, pr.	90¼	+ ¼			11,350,000	6 cum.	1½ Q.	Nov., 1909
Lackawanna Steel	64	.....	Mar.	10	34,978,000		.....	.....
Lake Sup. Corp.	27¼	.....	Oct.	6	40,000,000		.....	.....
New York Air Brake	95½	—1¼	June	17	10,000,000	8	2 Q.	Oct., 1907
Niles-Bement-Pond	104	.....	Feb.	3	8,500,000	6	1½ Q.	Dec., 1909
Niles-Bement-Pond, pr.	104	.....			2,000,000	6 cum.	1½ Q.	Nov., 1909
Otis Elevator Co.	54	.....	Mar.	15	6,375,300	3	1½ S. A.	Oct., 1909
Otis Elevator Co., pr.	99½	+3½			6,295,000	6 n. c.	1½ Q.	Oct., 1909
Pa. Steel	65	.....	May	10	10,750,000		.....	.....
Pa. Steel, pr.	115	—1			16,500,000	7 n. c.	3½ S. A.	Nov., 1909
Pittsburg Coal Co.	28¾	+ ¾	Mar.	9	28,104,600		.....	.....
Pittsburg Coal Co., pr.	79⅝	+4⅝			27,071,800	7 cum.	1¾ Q.	April, 1905
Pressed Steel Car	52	.....	Feb.	17	12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr.	106	+ ¾			12,500,000	7 n. c.	1¾ Q.	Nov., 1909
Pullman	193	+3	Nov.	10	100,000,000	8	2 Q.	Nov., 1909
Railway Stl. Spring	52	+ ¼	Mar.	4	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr.	106½	.....			13,500,000	7 cum.	1¾ Q.	Dec., 1909
Rep. Iron & Steel	45½	— ¾	Oct.	20	27,191,000		.....	.....
Rep. Iron & Steel, pr.	104	—3⅛			20,416,900	7 cum.	1¾ Q.	Jan., 1910
Sloss-Sheffield	86½	.....	Mar.	10	10,000,000	5	2 Q. †	Nov., 1909
Sloss-Sheffield, pr.	116½	—1¼			6,700,000	7 n. c.	1¾ Q.	Oct., 1909
U. S. Pipe & Fdy. Co.	32⅝	.....	June	23	12,106,300	2	1 Q.	Dec., 1907
U. S. Pipe & Fdy., pr.	84	.....			12,106,300	7 n. c.	1¾ Q.	Dec., 1909
U. S. Steel	91⅛	—1⅜	April	19	508,302,500	3 n. c.	¾ Q.	Sept., 1909
U. S. Steel, pr.	125¼	.....			360,281,100	7 cum.	1¾ Q.	Aug., 1909
U. S. Steel, 5s	105¼	+ ⅜			463,798,000	5	.....	.....
Va. Iron, Coal & Coke	73½	+2	Sept.	21	9,073,680		.....	.....
Westinghouse Elec.	81½	—1	June	16	27,173,200*		1¾ Q.	Oct., 1909
Westinghouse Air Brake	148½	—1½	Oct.	5	14,000,000*		4 Q.	Oct., 1909

Par value of shares, $100, except those starred (*), $50.
†Includes deferred dividend of ¼ of 1 per cent.

Copper Stocks.

New York.—Amalgamated Copper closed 88⅜, a gain of ⅝.

Boston.—Butte Coalition closed 28, a decrease of 1: Calumet & Arizona closed 101, a decrease of ¾: Calumet & Hecla closed 670, an increase of 10; North Butte Mining closed 50¾, a loss of 7¼; Quincy Mining closed 88, a gain of 3.

Financial Notes.

The Cincinnati Horseshoe & Iron Co., Cincinnati, has declared an initial dividend of 10 per cent, payable 2½ per cent quarterly. The Youngstown Sheet & Tube Co. has declared the regular quarterly dividend of 3 per cent. The Westinghouse Electric & Mfg. Co. has declared the regular quarterly dividend of 1¾ per cent, payable Jan. 15; the American Screw Co. has declared a dividend of 2½ per cent, payable Dec. 31; the International Nickel Co. has declared the regular quarterly dividend of 1½ per cent on preferred, and 1 per cent, and an extra dividend of ½ of 1 per cent on common, the preferred dividend payable Feb. 1 and the common dividends Mar. 3.

The Garvin Machine Co. has declared the regular semi-annual dividend of 3½ per cent on preferred stock, payable Jan. 1.

The Vulcan Detinning Co. has declared the regular quarterly dividend of 1¼ per cent on preferred stock, and in addition thereto ½ of 1 per cent on account of accumulated unpaid dividends payable Jan. 20.

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THE AVERAGE PAID CIRCULATION OF THE IRON TRADE REVIEW FOR THE ISSUES OF THE FOLLOWING MONTHS WAS:

January	5,506
February	5,346
March	5,396
April	5,508
May	5,533
June	5,551
July	5,572
August	5,597
September	5,609
October	5,628
November	5,634

December 30, 1909

A REMARKABLE RECOVERY.

It is hard to realize, except by direct reference to market quotations, that this year's closing prices of finished steel products are very close to the opening prices, yet such is the fact. Comparing prices at the opening, some of which were largely nominal, being subject to considerable shading, with prices at the close, which are firmly maintained, steel bars show an advance of $1 a ton, plates, shapes and black sheets we quote at the same prices as last January, while tin plates show a decline of $1 a ton. Standard rails are unchanged, and galvanized sheets are 0.05c lower. Billets and sheet bars are higher, and so, of course, is pig iron. Wire products are lower by $2 a ton on nails, $2 to $3 on plain wire and $5 on barb wire, while merchant steel pipe is about $8 a ton lower. Having regard to the shading in some products at the opening, and the extreme firmness at the close, it may be said with a very close approach to absolute exactness that closing prices, except on pipe, average as high as opening prices.

This, of course, is not restoring the 1907 level by any means, as all products except standard rails suffered reductions in 1907 of from $2 to $4 a ton. The steel trade has not had any expectation of restoring the 1907 level throughout, but has on the contrary definitely set itself against such restoration through the list.

The recovery was helped by the enormous increase in demand, but was not produced solely by that means, for advance began in some lines late in April, followed by others in May and June, yet it was months later that the steel industry as a whole found fairly full employment for its materially increased capacity. In the old days, it required full activity to advance prices. To take a leaf from times long gone by, the year 1897 saw record pig iron production, and also saw the lowest prices for pig iron and steel products in all history; 1898 saw an increase of more than 2,000,000 tons in pig iron, about 23 per cent, above that new record of 1897, yet prices in 1898 were not materially higher than in 1897; they remained ruinously low. The next year, 1899, saw a less increase in pig iron production, less by 275,000 tons than the preceding increase, but the additional increase was the last straw, and prices went sky-high. In the past eight months, it did not require that last touch to produce a fair and reasonable reaction towards better prices.

The year 1909 will always be remembered as the year in which the effort to maintain finished steel prices collapsed, but in the light of the history since made it will be well to remember that the year is also conspicuous as witnessing a healthy and reasonable reaction towards fair prices with an absolutely open market, but with a spirit of fairness and good will pervading the trade which never before existed under similar outward conditions.

SCRAP SUPPLY BREAKING DOWN.

An analysis of blast furnace statistics shows that the pig iron production of the country has been running at a rate about 4,000,000 tons a year in excess of the best rate maintained for any length of time in 1907, while the production of foundry iron has made practically no gain. The merchant furnaces have been doing better than in 1907, but they are shipping more Bessemer and basic pig iron to steel works. Compared with the average operations of 1906, the present pig iron rate shows a gain of more than 6,000,000 tons, so that it is quite evident that a very much larger tonnage of steel making iron is being used than ever before.

At this time of year, it is natural to attempt to sum up the results of the year's operations. We have accurate blast furnace statistics, but no steel works statistics. Can one proceed to estimate steel production by the blast furnace statistics? If the attempt is made, serious complications at once arise. It must be granted that the production of steel making pig iron has shown an enormous increase. It is well known that the Bessemer steel works, in some cases, have not done nearly so well as in 1906 or 1907. If the Bessemer steel works have lost, or even if one grant for the sake of emphasizing the argument that they have made some gain, there has been a very great gain in the consumption of basic pig iron. In times past, a ton of basic pig iron and about a ton of scrap went together, with some ore usually, to make two tons of steel ingots. If each additional ton of basic pig iron has meant an additional ton of scrap, new or old, there has been a miraculous gain in basic open-hearth steel ingot production. It is inconceivable that the gain in basic open-hearth steel production has been double the gain in basic pig iron production.

If the gain in steel has not been so great, then a portion of the gain in pig iron has been to make up for the scrap which would have been used, had the old proportions remained. There is no doubt that there has been a making up of this sort, to an extent, but as to what extent only the official figures of steel production, and of pig iron production by grades, can furnish information.

A considerable part of the scrap consumed in the basic open-hearth industry of the country comes from Bessemer steel works, scrap that in the old days found its chief utilization in the Bessemer converter, much or little being used

to cool the heat, according to the silicon contents of the iron and other circumstances. There were many brushes about silicons between the blast furnace managers and the Bessemer steel works managers when the latter were deprived of their scrap in favor of the basic open-hearth furnace, but that is by the way. Bessemer steel production declined from 1906 to 1907, from 12,243,229 tons of ingots in 1906 to 11,634,276 tons in 1907, thereby diminishing the contribution to the scrap supply, while production of basic open-hearth steel ingots and castings increased from 9,658,760 tons to 10,279,315 tons, a change in the alignment of 1,200,000 tons, which obviously was bad for the scrap supply. This year there has been a further and larger change in the alignment. Should it not be that Bessemer steel production has undergone a material decline from 1907, at any rate basic open-hearth steel has shown a great increase.

For convenience, one may roughly divide the scrap supply for the basic open-hearth steel industry into three classes: New material from Bessemer steel manufacture, new material from basic open-hearth steel manufacture, and old material. The first named has probably decreased; the second, of course, has increased, but that increase could not, in the nature of things, be sufficient. The outcome of old material perhaps has not increased at all; at any rate it has not increased adequately. The activities of the past year have not been such as to bring out as much old material, relatively, as the activities of 1906 and 1907. The railroads have been repairing cars rather than buying new ones to replace old equipment, and all along the line there has not been so much of heavy work, replacing old and lighter structures of whatever description; rather the heavy consumption of steel lately has been in light lines, the putting into use of which does not displace old material to any great extent.

The industry must find an answer to this condition. The scrap trade has been disposed to find the answer by pushing up the price of melting grades of steel, and has gotten heavy melting steel in the Pittsburg district to a higher price than basic pig iron, both delivered. Such a trend will only be temporary; the basic open-hearth steel industry cannot and will not suffer it to be permanent; it will be driven to find more expedients, at one point or another, to escape the high production costs involved. At certain points, remedies are being adopted, as in duplexing, and the most conspicuous instance at the moment of the duplex process being adopted is by an interest which a few months ago was the leader in bringing about a method of buying scrap by steel works in its district calculated to hold down the price of scrap. The adoption of the one remedy does not, of course, confess the failure of the other; possibly it may be held to suggest that there is no use applying only one remedy when two are available. The scrap dealing trade is not wholly responsible for the present condition as to relative values of pig iron and scrap, but it has had much to do with it. A trade which depends for profits not upon ultimate selling prices, but upon what amounts practically to a fixed brokerage per ton, ought to try to make its profits without hampering its customers in the utilization of the material in which it deals.

The past few months have seen the active seeking for remedies for the uncomfortable position produced by high scrap prices; the forthcoming year will likely see the adoption of remedies at various points. The proportion of basic pig iron to basic steel produced, by whatever methods, will increase.

"IRON RANGES OF MINNESOTA."

The Virginia *Enterprise*, published by W. E. Hannaford at Virginia, Minnesota, has issued a work called "Iron Ranges of Minnesota," which contains a large amount of historical and descriptive matter covering the Mesabi and Vermillion iron ranges with a limited amount of comment on the Cuyuna range. Besides the matter of general interest, there are numerous "write-ups" of the men and industries along the ranges. The work is well printed and is embellished with numerous half tone engravings which add materially to its value.

NEW BRASS FOUNDRY.

A new company at Elkhart, Ind., is the Northern Indiana Brass Foundry, which has just been incorporated. The capital stock is $10,000, all of which, it is understood, has been subscribed. The directors for the first year will be C. G. Schweitzer, Sarah Schweitzer and V. E. Schlotterback.

INCREASED CAPITAL

Leads to Enlarged Plans for Western Steel Corporation.

A dispatch from San Francisco, confirmed at the general offices of the Western Steel Corporation at Seattle, states that the capitalization of the corporation has been increased from $20,000,000 to $40,000,000. Herbert E. Law, a San Francisco capitalist and real estate operator, together with eastern capitalists, recently became interested in the Western Steel Corporation, and they have subscribed for the increased capital stock. In addition to its present holdings the company recently acquired extensive coal deposits on Graham Island, B. C., held by Mr. Law. The company has also secured options on the largest of the three big iron ore bodies in California and on the California-Nevada state line, not far from railroad transportation.

A report, confirmed at the offices of the Western Steel Corporation but denied by the local officials of the Moran Co., is to the effect that the Western Steel Corporation has purchased the controlling interest in the plant and business of the Moran Co., shipbuilder, Seattle, and that the entire plant will be moved to Irondale. The consideration named is $2,000,000. This amount is very low, being scarcely more than the value of the real estate holdings of the Moran Co. It is also understood that the Western Steel Corporation holds an option on the Bullen Shipbuilding Works, Esquimalt, near Victoria, B. C.

The Western Steel Corporation is an outgrowth of the Irondale Steel Co. and is constructing a small blast furnace, open-hearth plant and rolling mill at Irondale, near Port Townsend, Washington. Work on the Irondale plant has been in progress for over a year. The company expects to roll its first steel about March 1.

James A. Moore, president of the Western Steel Corporation, said recently: "We shall double the capacity at Irondale by July 1; we shall also erect two modern blast furnaces of 300 tons each, one of which will be at Irondale and one in British Columbia. Ample capital has been subscribed by local and Vancouver people, combined with subscriptions of eastern capitalists, to carry out all of the present plans of the company."

Reports have been current to the effect that the Poughkeepsie furnaces, Poughkeepsie, N. Y., were to resume operations. These rumors are evidently without foundation, as the interests reported to be negotiating for their lease with a view to starting them disclaim any such intention. The two stacks were last operated in 1903.

JAMISON COMPANY

Acquires Large Acreage of Coking Coal Land in West Virginia.

The third and the largest single coking coal deal of the past week to be announced in Pittsburg is that just negotiated by the Jamison Coal & Coke Co., Pittsburg, whereby it acquires an additional tract of 7,500 acres of West Virginia coal land from the Georges Creek Coal & Iron Co., of Baltimore. The property purchased adjoins that of about equal extent recently secured by the same interest from the Barrickville Coal & Coke Co., and is located near Fairmount, W. Va. The Jamison Coal & Coke Co. accordingly now controls a solid block of 15,000 acres and becomes one of the leading holders of West Virginia coking coal. The consideration in the transaction is given as about $3,500,000. H. H. Patterson, Pittsburg, conducted the negotiations.

The new property of the Jamison company is partly developed, having two shafts and a battery of 60 coke ovens. The transfer includes all the mine and coke-making equipment, steel cars, etc., as well as the coking coal property of the Georges Creek Coal & Iron Co., located in West Virginia. It is the purpose of the Jamison company to push the development of all its West Virginia holdings as rapidly as possible, and these plans of improvement contemplate the erection of a large number of additional coke ovens. Upon the Barrickville tract two shafts are now being sunk and a third is being planned. As soon as this property is adequately opened the construction of coke ovens will be commenced.

ELECTRIC LOCOMOTIVES ORDERED.

The Westinghouse Electric & Mfg. Co. has booked an additional order for 25 electric locomotives for use on the New York terminals of the Pennsylvania Railroad Co. The contract just placed makes a total of 50 electric locomotives now building for the Pennsylvania road in the shops of the Westinghouse company at East Pittsburg. The delivery date upon equipment is by July, 1910.

SPANISH ORE SUPPLY SHORT.

The heavy sales for delivery in America during 1910 have resulted in a steady advance in Spanish ores, which Bilbao sellers are now holding at close to 20 shillings per ton, or 4 shillings over the prices prevailing earlier in the year. Continental consumption is increasing and there is some alarm among British furnace men, that, even at this high price level, they may not be able to secure their full requirements during 1910. During November, Spanish ore shipments to Great Britain were 455,599 tons, making a total movement for the 11 months of the year of 4,288,795 tons.

TO SHIP ORE FROM TEXAS.

That the Santa Fe railroad is planning to open up the iron ore regions of eastern Texas was the announcement made during an inspection tour recently at Houston, Tex., by J. W. Kendrick, of Chicago, vice president of the Santa Fe railroad in charge of operating. He is quoted as saying that the Santa Fe System in the coming year will probably build 50 miles of new track in the iron ore regions, and will also build new docks at Port Bolivar, Tex., for the purpose of handling the ore. It is further stated that the Santa Fe figures that it will haul about 1,000,000 tons a year to the Port Bolivar docks, whence it will be shipped to an Atlantic coast port. Mr. Kendrick is quoted as saying that the new dock at Port Bolivar should be under way within a year.

RICHARDS MINE OPERATIONS.

The Richards mine of the Thomas Iron Co., located at Mt. Hope, N. J., recently began operations in a new vein which is yielding an ore superior in many respects to the ordinary product of the mine. The output of these workings is about 100,000 tons annually, all of which is used at the various blast furnace plants of this interest. About 10 years ago these deposits were examined by outside engineers, who prepared an estimate of the available tonnage remaining in the mine, since which time it has produced considerably more than this estimate and has fully that tonnage still in sight.

FIRST CAST THIS WEEK.

The Deemer Steel Casting Co., New Castle, Del., has just completed its new plant, and expects to make its first cast this week. Upwards of $100,000 of business has been placed in the company's books awaiting the operating of the plant, which is thoroughly modern and up-to-date in every particular. Mr. Deemer has had 25 or 30 years' of experience in the business. He operates another plant in the southern part of the sate of Delaware, which makes a specialty of exactness of delivery in time contracted, and has built up a considerable business based upon the character of its product.

IRONMASTERS.

Divided on Question of British Tariff Reform.

Birmingham, Eng., Dec. 15.

The question of tariff reform is occupying a prominent place in the election, and among its leading apostles is Douglas Vickers, of the firm of Vickers, Sons & Maxim, Conservative candidate for the Brightside division. The majority of ironmasters seem to favor tariff reform, but there are some most distinguished exceptions, such as Sir Hugh Bell, Sir Christopher Furness, Sir Charles MacLaren, and others whose iron and steel interests are among the greatest in the kingdom. The election fight is likely to be the most strenuous for several decades, and it will turn very largely on trade questions.

In the Sheffield district prices of vanadium and tungsten steels are advancing so rapidly that it is believed somebody is trying to corner the market. The supplies are mainly for American and continental markets. The imposition of a high tariff on high-speel steels by the French chamber of deputies, it is recognized, will materially hit the Sheffield trade.

WILL BUILD CRANES.

The Toledo-Massillon Bridge Co., Toledo, O., is doubling the capacity of its machine shop by the addition of many new tools and in addition to the fabrication of structural steel will engage in the building of electric and hand cranes, hoists, coal and ore handling bridges, grab bucket machinery, etc. Chas. H. Tucker, formerly chief engineer of the Case Crane Co., Columbus, O., will become associated with the Toledo-Massillon Bridge Co., Jan. 1. He has had a wide experience in the designing and building of cranes, having been connected with the Pawling & Harnischfeger Co., Milwaukee, for 15 years, and during the past five years has been in the employ of the Case Crane Co. Mr. Tucker will have charge of the crane department, and several new designs are now under way, inquiries for which have already been received from some of the largest plants in the middle west.

The strike of Chicago Pneumatic Tool Co. machinists, on for two years, has been settled at Franklin, Pa.

The Hall stack at Sharon, Pa., of the Republic Iron & Steel Co., will be blown out shortly for relining.

LAKE CARRIERS

Will Meet at Detroit to Discuss Accidents and Other Subjects.

The annual meeting of the Lake Carriers' Association will be held in Detroit on Jan. 19, at which time careful consideration will be given to the list of accidents for the year. They have been many and costly. Vessel owners are now carrying a part of their insurance and are of course vitally interested in minimizing the number of accidents. There will doubtless be much discussion upon the subject of limiting navigation during the fall season, but whether anything can be actually done along this line remains to be seen.

And now that it is assured that ore prices will be advanced, it is certain that the freight rate will be advanced 10 cents. These advances will make a better feeling throughout the whole trade.

Reports from Outer Duck Island indicate that the Wissahickon is in better shape than was supposed and will probably be raised during the winter.

Capt. James Reid, the wrecker, has taken the job of raising the Steinbrenner, sunk in Mud Lake, and delivering her at Detroit for $30,000 on the no-cure no-pay plan. She has a 40-foot hole in her side, which he is preparing to patch and will then pump her out.

Wild weather has prevented work either on the car ferry Ashtabula, stranded at Port Burwell, or the bulk freighter W. C. Richardson, sunk outside Buffalo harbor.

THREE COMPANIES INVOLVED IN NEW ORGANIZATION

Stockholders of the three companies comprising the new Orrville Pump & Furnace Co., Orrville, O., recently met for the purpose of effecting the organization of the new company, the incorporators of which are George Wendling, Chris Smith, S. M. Breneman, Elias Conkell and H. A. Miller, the latter of Barberton, O. The capitalization is $75,000, divided into $50,000 common and $25,000 preferred stock. It has now under construction a brick, steel and concrete foundry 70 x 110 feet; has practically completed a brick pattern and machine shop 40 x 70 feet, two stories, and will begin shortly the construction of the central power plant, 30 x 60 feet, in which will be installed two boilers, a 125-horsepower Corliss engine, and an electric generator. The machine shop and foundry will be equipped with the latest shop appliances which will be electric driven by individual motors.

The three companies embraced in the combination are the Orr Foundry Co. and the Service Pump Co., of Orrville, and the Rasor Furnace Co., of Barberton, O. The latter company's plant at Barberton, includes a sheet metal factory, ware room 40 x 70 feet, two stories and an assembling room 30 x 50 feet. While the foundry and machine work will be done at Orrville, the Barberton plant will be utilized for assembling and ware rooms. It is expected to have the new plant in operation by April 1. The company's pumps will be made under Conkell patents, the special features of which are the simplicity of the valve, being two pieces; the positiveness of action under adverse conditions, being actuated by direct impact with the piston head, and long life.

SELLS ABERDEEN WAREHOUSES.

The Vulcan Iron Works, operating plants at Seattle and Aberdeen, Wash., for the manufacture of logging engines and general machinery, has disposed of the store and iron warehouses connected with the Aberdeen plant to eastern investors. The transaction represents an investment of $500,000 by the purchasers. Possession will be given on Jan. 1. It is stated that as soon as the litigation connected with the water front property of the Vulcan Iron Works, at Aberdeen, some of which is being condemned by the Union Pacific railroad, is settled, the company will build new works at the Gray's Harbor City. The Vulcan Iron Works is completing a new plant in Seattle, which will be one of the largest machinery manufacturing establishments on the North Pacific coast.

EASTERN STEEL CO. IMPROVEMENTS.

Announcement is made that the two additional open-hearth furnaces to be installed by the Eastern Steel Co. at its plant at Pottsville, Pa., will be of 80-ton capacity each. The present equipment consists of four 50-ton furnaces, hence the increased output will be about 80 per cent. The new furnaces will be of the usual stationary type. In connection with these improvements, the company's shipping yard facilities will be enlarged and other minor betterments made about the plant, including additional transfer tables on the 19-inch mill. A 125-ton ladle crane will also be installed.

FURTHER ACTIVITY

Shown in Lebanon District—Cornwall Ore Bank Interest Sold.

Considerable activity is being manifested in the Lebanon district these days. The Lackawanna Iron & Steel Co., has blown in No. 2 Bird Coleman furnace, making four stacks active in the county and one on repairs. The Lebanon Valley Iron Co., of Lebanon, is about to build another mill at its plant, making four in all and will establish departments for manufacturing spikes, rivets, bolts and nuts. It will double its present capacity and spend almost half a million early next year.

Heavy production continues to mark the operations of the Pennsylvania Steel Co., the output of the blast furnaces being at a record breaking rate. The open hearth steel production this month has run very high and may make a splendid record.

The Harrisburg Pipe & Pipe Bending Co.'s annual reports show an increase of over 50 per cent in some departments and a large increase in total production for the year. J. H. Patton was re-elected president and W. T. Hildrup jr., secretary and treasurer.

The Reading Iron Co. has suspended operations at Keystone furnace at Reading for some repair work. The furnace will be started again as soon as possible.

The Pennsylvania Steel Co., which for some years has owned a controlling interest in the Cornwall ore banks, has bought for $281,000 the holdings of William C. Freeman, one of the members of the Coleman family, in the Ore Banks Co. The Freeman holdings were slightly over a one-thirtieth interest.

The Lukens Iron & Steel Co. has increased its active furnace list at its Coatesville plant. Five of the new furnaces have been fired.

WABANA ORE DIVIDENDS.

The Nova Scotia Steel & Coal Co., New Glasgow, N. S., is to increase its capital by $1,000,000, having declared a stock bonus of 20 per cent to present shareholders. This interest operates a blast furnace and steel-making plant at New Glasgow, and owns the extensive iron properties at Wabana, Newfoundland, from which shipments are being made to the eastern Pennsylvania furnaces. President Harris states that the position of the company, from the standard point of finances, material resources and prospects, is the best in its history.

AMONG MACHINERY MAKERS.

NEW YORK.

Deliveries Continue To Grow More Unsatisfactory.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., Dec. 28.

The machine tool trade in the east closes the year with more than anticipated activity, the holiday week seemingly having little effect in slowing down the volume of current business. The feature of chief interest was the circulation of inquiries for a number of large tools by the New York Central; these came out piecemeal and it is not known exactly how large an amount is aggregated, but it is expected that an early decision will be reached and that the equipment will go into the West Albany shops. The General Electric Co. is also in the market, one inquiry recently circulated calling for eleven radials, and it is understood that a considerable number of tools are to be purchased for its Schenectady works. Two manufacturing interests which have recently closed for machine tools aggregating substantial amounts are the Farrel Foundry & Machine Co., Ansonia, Conn., and the W. & B. Douglas Co., Middletown, Conn., pump manufacturers.

Deliveries continue to grow more unsatisfactory and it is not unusual for a manufacturer who has become crowded with orders and has neglected to cover his machine tool requirements, to buy from stock some piece of equipment approximating his needs rather than wait the several months necessary to secure delivery on the exact size or type required. Milling machines are now six months ahead, slotters run from four to six, small lathes are obtainable in about three months and on other lines the deliveries vary. The first of the year will see price adjustments on lathes and possibly on some other machine tools.

There will be some call for pumps, hoisting machinery and other mine equipment in connection with the iron ore developments planned in Dutchess county, New York, near Poughkeepsie. Two companies have been organized to engage in this work, and each will drive a slope into the ore bodies, which heretofore have been worked in a limited way by open pit methods. The interested companies are the Kelly Iron Ore Corporation, 45 Exchange Place, of which Robert D. McKay is president, and the Dover Furnace Ore Co., 150 Broadway, of which John M. Coleman is president.

A surprisingly heavy demand from unexpected sources, is noted for the radical angular drilling attachment for boring square holes. This device can be attached to milling machines, lathes or horizontal drill presses. It is manufactured by Radical Angular Drill & Tool Co., for which the Vandyck Churchill Co., 91 Liberty street, is selling agent for the United States.

James Cornish has been appointed receiver for the American Vacuum Cleaner Co., 225 Fifth avenue, with a factory in Newark, N. J. Bankruptcy proceedings have been instituted by three creditors, one of which is the Garvin Machine Co.

It is anticipated that considerable buying of wood and metal working machinery, power plant and foundry equipment will result from the recent fire at the Marvel shipbuilding plant, Newburgh, N. Y. Insurance was ample to cover the loss.

George G. Prentice & Co., Inc., New Haven, Conn., finds the demand for its multiple spindle automatic turret machines has never been better. Practically all this year it has been running full, night and day shifts, and could sell at least twice as many machines as it can produce. Orders are booked several months ahead, and indications are that there will be no let up during the coming year.

CHICAGO.

Railroads Coming Into Market and Outlook is Encouraging.

Office of THE IRON TRADE REVIEW, 1328 Monadnock Block, Dec. 28.

The machinery market has been quiet for two or three weeks, December not showing up as well in sales as some of the previous months, but at the close there is indication of revived interest, and a number of railroads are coming into the market for good sized lists. For several weeks the roads have been buying very lightly, taking two or three tools at a time, and the regular budgets have been delayed probably for the purpose of having the purchases go into the new year's account. The buying by automobile manufacturers has shown temporary easing up, but this has been offset to a great extent by general machine shop purchases. Lathes and shapers have been in good demand, and planers in somewhat less request.

The Union Pacific Road recently purchased a number of machines through Chicago agencies, and the Burlington is in the market with a list numbering 30 to 40 items. The Oregon Short Line list, which previously has been referred to in these columns, has appeared and is given below.

Machinery manufacturers and their agents are all looking forward to the coming year with every expectation of heavy buying from all lines of industry, and report that the present inquiry indicates that this revival will be attained early in January. The Oregon Short Line list is as follows:

Ogden.

One Plate shear,—motor drive.
One Vertical punch,—motor drive.
One pair patent single screw tool clamps, for car wheel lathe.
One 18-inch tool lathe—Pratt & Whitney—motor drive.
One 28-inch rigid turret lathe—motor drive.
One No. 8 four-sized timber sizer—motor drive.
One No. 3 automatic cut-off saw—motor drive.
One No. 10 Besely spiral disc grinder—belt drive.
One 42-inch planer—motor drive.
One Turret lathe, motor drive.
One Tool room grinding machine No. 3 Brown & Sharpe—belt drive.
One Steam hammer—3300 pounds.
One Double head bolt cutter—motor drive.
One 36-inch rapid production vertical turret lathe,—motor drive.
One Six spindle multiple drill,—motor drive.
One Double head axle lathe,—motor drive.
One Vertical hollow chisel mortising and boring machine,—motor drive.
One No. 63 universal wood worker,—belt drive.
One Band saw, 42-inch,—belt drive.
One Radial drill 72-inch,—motor drive.
One No. 2-A frog and switch saw—Q. M. S. —motor drive.

Pocatello.

One No. 10 Besely spiral disc grinder,—belt drive.
One Steam hammer,—2500 pounds.
One No. 5 double punching and shearing machine 30-inch throat,—motor drive.
One Guillotine or alligator shear,—motor drive.
One 26-inch Morton draw cut shaper,—motor drive.
One 32-inch special railroad draw cut shaper, —motor drive.
One Steel tired car wheel lathe 42-inch,—motor drive.
One Turret lathe, 24-inch,—motor drive.
One 36-inch Turret lathe,—motor drive.
One 3-inch Ajax forging machine,—motor drive.
One 24-inch vertical turret lathe,—motor drive.
One 36-inch Rapid production vertical turret lathe,—motor drive.
One Six spindle multiple drill,—motor drive.
One 28-inch Rigid turret lathe,—motor drive.
One No. 1-M. Q. M. S. metal saw—motor drive.

Salt Lake City.

One 42-inch engine lathe,—motor drive.
One turret lathe 24-inch,—motor drive.
One 36-inch planer,—motor drive.
One No. 2 Universal milling machine,—motor drive.
One 40-inch Vertical drilling machine,—belt drive.
Also one 40-inch Vertical drilling machine for Glenn's Ferry, Idaho, and one for Lima, Montana.

Sparks.

One Engine lathe 24-inch,—motor drive.
One Engine lathe 18-inch,—motor drive.
One Bolt lathe 14-inch,—motor drive.
One Turret lathe 36-inch,—motor drive.

One 32-inch special railroad draw cut shaper,—motor drive.
One Radial drilling machine 72-inch,—motor drive.
One Forging Furnace.
One Bar shear,—motor drive.
One solid frame universal wood worker No. 63 J. A. Fay & Egan Co.
One Acme double head stay bolt cutter,—motor drive.
One Pipe machine, No. 207-A Oster Mfg. Co.

CINCINNATI.

Year's Output About Equal to That of 1907.

Office of THE IRON TRADE REVIEW, First National Bank Bldg., Dec. 28.

The last month of the year has been productive of a highly satisfactory run of orders and the outlook for the new year is exceedingly bright. The noticeable pickup in demand for planers is well maintained and the shops are running full force on orders. Wood working machinery continues to lag for some unaccountable reason. The demand in this direction has not responded and kept pace with the demand for machine tools, engines, and other classes of machinery. The business done in the last half of the year is enabling a number of the plants to make a rather satisfactory showing of the year's business, in spite of the dullness which prevailed in the first half.

The table prepared sometime ago by John M. Manley, secretary of the Cincinnati branch of the National Metal Trades Association, showing the percentage of operatives employed in the shops of the members of the Cincinnati branch, using the high record of June 15, 1907, as 100 per cent, and showing the percentage of operatives for each quarter, is again presented with the figures given for December 15, 1909.

	No. of operatives. Per cent
June 15, 1907	100
Sept. 15, "	97
Dec. 15, "	83
Mar. 15, 1908	67
June 15, "	56
Sept. 15, "	53
Dec. 15, "	56
Mar. 15, 1909	62
June 15, "	65
Sept. 15, "	72
Dec. 15, "	85

The increase in the last puarter from 72 per cent to 85 per cent in the shops of the members reflects a gratifying increase in the activities in machine tool lines, and metal working industries. There are some new shops, not members of the association, which have recently increased their facilities and if these could be taken into account it is quite probable that the total number of employes in the Cincinnati shops would now nearly equal the number of operatives employed in 1907. The product of the Cincinnati plants is probably equal to the production of 1907, as a number of shops replaced old equipment with new and up to date machines during the dull period early in the year and the process of adding machinery has been going on steadily for the past three months. With the introduction of elements of higher efficiency the output may be regarded as equal to the output of 1907.

B. B. Quillan, of the Cincinnati Planer Co., entertained the entertainment and executive committees of the Cincinnati Metal Trades Association at dinner at his home on Dec. 23. A feature of the evening was the advent of a Santa Claus, who distributed appropriate souvenirs. The committees held their regular meetings after the dinner.

The Lodge & Shipley Machine Tool Co. reports the outlook for next year as excellent and the company will close up a good year's business in spite of the conditions prevailing early in the year.

The G. A. Gray Planer Co. is running its shop full time and full force on orders and the officials regard the outlook for 1910 as decidedly encouraging.

The condition of the machine tool business in the heavier lines, while not equal to the call for the lighter tools, is highly satisfactory when it is considered that there has been a lack of railroad buying which is a factor upon which the manufacturers of these lines depend to a large extent.

MILWAUKEE.

Year Closes With the Machinery Business in Highly Prosperous Condition.

Milwaukee, Wis., Dec. 28.—As the year closes, and the big machinery manufacturers are closing their books, it is very apparent that conditions have improved about 40 to 50 per cent over the previous year.

The Allis-Chalmers Co. will start the new year with the largest force it has ever employed. This is, however, only 85 per cent of the expected capacity—it being impossible to tell the exact capacity because it has never been fully tested. Orders booked during the five months ending Nov. 30 were 70 per cent in excess of the corresponding period in 1908 and 58 per cent in excess of 1907. The growing business in small apparatus, which can be produced in comparatively short time, has increased the earnings considerably, as capital is not tied up for so long a period as in the case of heavy machinery and engines requiring several months to build.

The enormous amount of new construction work under way or already completed will be reflected early next year in greatly increased productions.

The Falk Co., of Milwaukee, foundryman and railway appliance manufacturer, is working night and day and Sundays, to complete the construction of probably the most intricate piece of railroad crossing in the west. It is of manganese steel and will be laid at Second and Sycamore streets, Milwaukee, by the Milwaukee Electric Railway & Light Co., this point being the entrance of the big terminals. There are four right angled tracks, four curves and several leads of other kinds. Gen. Otto H. Falk is personally superintending its construction.

The Wausau Iron Works are experiencing the busiest season since its organization. Among contracts now under way are: Structural steel for new Marathon Paper Mills Co. plant; four steel bridges for Dancy drainage district, 90, 75, and two 65-foot; one 100-foot steel bridge for Mead township, Clark county; steel truck bridge for Curtis & Yale lumber mills.

The Milwaukee Bridge Co. has the contract for repairing the Sixth street viaduct at Racine, Wis,, which was badly damaged during the fire which destroyed the plant of the Racine Mfg. Co., on Dec. 12.

The Milwaukee board of public works has decided to build the new bascule bridge provided for in a bond issue to be voted upon at the April election, at Wells and Oneida streets. The finance committee has decided to recommend the construction of a $150,000 bridge at Wright and Bradford streets.

The J. M. Kohler Sons Co., of Sheboygan, Wis., manufacturer of plumbers' appliances, sanitary ware, etc., is installing one of the most modern power plants in Wisconsin. The power house is 105 x 132 feet, 35 feet high, of brick and steel. A new 1,000 horsepower cross compound condensing engine, direct connected to a 750-kilowatt Crocker-Wheeler generator will be installed. Auxiliary equipment consists of a 375-horsepower Corliss engine, direct connected to a 250 kilowatt generator and one 150-horsepower Corliss engine, with 150-kilowatt belted generator.

The Optenberg Iron Works, of Sheboygan, Wis., has the contract for building and installing tthe complete power equipment for the new plant of the American Mirror Plate Co.

The property of the A. W. Stevens

Co., of Marinette, Wis., maker of agricultural devices and machines, has been purchased by the Stevens Manufacturing Co., a reorganization of the defunct concern, backed by the Marinette chamber of commerce, for $20,000 at receivers' sale. The company has 100,000 feet of floor space, 15 acres, side tracks and warehouses. It does its own foundry work. S. J. Dietz, of Bloomington, Ill., is president; John J. O'Connell, of Marinette, secretary and treasurer, and W. C. Rose, superintendent. Patents on an improved harrow have been purchased and this will be an additional line to be produced by the rehabilitated concern.

BUFFALO.

New Plants Being Projected and Extensions Made to Old Ones.

Office of THE IRON TRADE REVIEW, 932 Ellicott Square, Dec. 28.

There has been a slight falling off in inquiries for machinery, but makers are rushed with orders and many shops continue running two shifts. The lull in inquiries, and corresponding quiet in the placing of orders serves to give the machinery builders opportunity to catch up on deliveries. The pressure for deliveries of small special machinery ordered by motor car builders and gas engine makers does not weaken.

Included among new projects at this point is the plan of the King Sewing Machine Co., to build a $150,000 plant at Buffalo. The company has leased eight acres of land on Rano street in the Black Rock district. The factory now operated by this company is on Court street but the business has outgrown present facilities. The machinery equipment will be extensive and orders for it have not been closed. The proposed plant will include foundry, machine shop, factory and office buildings.

Work on the new blast furnace of the Wickwire Steel Co. is progressing and officials of the company state it may be blown in July 1.

The Aluminum Castings Co., Buffalo and other cities, will erect here a one-story steel and brick foundry to cost $40,000.

The East Amherst steel foundry plant of the Buffalo Cement Co., will be enlarged. An addition 50 x 60 feet will be erected.

The plant of the Otis Elevator Co., to make extensive improvements at the Buffalo plant is due to the increase in its small elevator business. Most of the elevators of the smaller class which are manufactured by this interest are made in Buffalo.

COMPLETING MERGER

Of Dominion Iron & Steel and Dominion Coal Companies.

Meetings of the directors of the Dominion Iron & Steel Co. and the Dominion Coal Co. were held at Montreal, recently, at which important steps toward merging these corporations were taken. James Ross, president, and R. B. Angus and Graham Fraser, retired from the directorate of the Coal company, and were succeeded by J. H. Plummer, Hon. L. Forget and Sir Henry M. Pellatt. Mr. Plummer was elected president of the company. The time allowed for the shareholders of the Coal company to decide whether they would sell their stock at $95 per share or go into the merger, having expired, the returns showed that of the total holdings only 6,885 shares were offered on those terms, the great majority having decided to go into the merger. The purchasing syndicate formally transferred the 50,000 shares of Coal company stock taken over from James Ross to the Steel company. Outstanding matters of dispute between the companies were left for settlement to the auditors, and all that remains to be done is to fix the basis of the amalgamation.

COKE PROPERTIES SOLD AT AUCTION.

The entire plant and equipment of the Cresson & Clearfield Coal & Coke Co., located in Cambria county, Pa., has been disposed of by Samuel T. Freeman & Co., Philadelphia, at auction sale, the consideration being $326,500. The sale followed foreclosure proceedings brought by the bondholders. The properties include over 5,500 acres of land, coke oven equipment, a small railroad and about 100 dwellings.

CAPITAL REDUCTION ALLOWED.

In the chancery division on Dec. 7, Justice Parker heard a petition by the Harvey United Steel Co., Ltd., for a reduction of its capital by the return to the shareholders of 5s per share, being capital in excess of the wants of the company, says The Ironmonger, of London.

Mr. Romer, K. C., stated that the original capital was £450,000, divided into 450,000 shares of £1 each. The company was incorporated in 1901 to acquire and control the undertakings of the Harvey Steel Co. of Great Britain, Ltd., the Harvey Continental Steel Co., Ltd., the Harvey Steel Co. of New Jersey, and the Societe Procedes Harvey. In 1905 the capital was reduced to £225,000 by the return of 10s a share to the shareholders, and it was now proposed to reduce it to £112,500 by returning 5s to the shareholders and reducing the nominal value of the shares to 5s each. Counsel stated that it was an extremely successful company. It was not a manufacturing company, but its revenue was derived from persons working its patents and interest on invested funds, and accordingly capital was not wanted by the company to any great extent.

His lordship sanctioned the reduction.

STEADY INCREASE

In Gross Profits Made by Crucible Steel Co. of America.

A steady increase in gross profits over the three months of the quarter ending Nov. 30, 1909, is shown by the full statement of the Crucible Steel Co. of America, which is as follows:

Gross Profits—		
September		$ 428,858.10
October		471,634.09
November		510,413.51
		$1,410,905.70
Deduct charges and appropriations for the following purposes, viz:		
Depreciation and repairs	$305,964.03	
Net profits...		$1,071,793.43
Surplus, Nov. 30, 1909		$3,863,245.12
Surplus, Nov. 30, 1908		2,095,882.75
Increase		$1,767,362.37

The net profits for the present quarter, of $1,071,793.43, compared with those for the corresponding period of last year of $402,988.48, show an increase of $668,804.95 in favor of the present quarter.

COAL AND COKE SHIPMENTS FOR NOVEMBER.

The statement of coal and coke shipments in short tons carried on the Pennsylvania Railroad Co.'s lines east of Pittsburg and Erie, for the month ending Nov. 30, 1909, as compared with the tonnage of the corresponding period in 1908 is as follows:

	1909.	1908. Increase.
Anthracite coal	1,043,457*	1,251
Bituminous coal	3,573,203	315,761
Coke	1,279,980	560,931
Total	5,896,640	875,441

Total shipments carried in this territory over the present year to date, compared with those of last year are as follows:

	1909.	1908. Increase.
Anthracite coal	10,128,629*	133,068
Bituminous coal	35,283,701	2,931,503
Coke	10,683,665	4,054,107
Total	56,095,995	6,852,542

*Decrease.

THE INFLUENCE OF HIGH SPEED STEEL ON RECENT MACHINE TOOL DESIGN,

And the Possibilities of Existing Designs Which Operators Fail to Realize

By O. M. Becker.

To the traveler visiting many machine shops, if he be well informed as to the present day possibilities inherent in high-speed tools and machines, nothing can be more striking than the comparatively small advantage taken of these possibilities in regular practice. In shop after shop the new tools seem scarcely known. Especially is this the case in general manufacturing in the metal trades. Even where the value of high-speed steel tools has apparently been recognized, they are, generally speaking, worked at surprisingly low efficiencies. Where a speed of 75 to 100 feet per minute is readily attainable, and perhaps higher still within the possibilities, it is not unusual to see 40 to 50, and even less, the standard. And in feeds there seems but little change, generally speaking, from the former standards. It would seem, broadly speaking, that advantage is taken rather of the superior lasting qualities of high-speed tools, than of greater cutting powers.

Neglect Due to Conservatism.

Apparently this neglect, this hesitancy in seizing upon every possible element making for highest efficiency, arises from a want of suitable equipment, whether that want in turn grows out of inherent conservatism, disinclination to change, or out of inexpediency depending upon other considerations. Whatever the reason, there can be no question that old equipment continues to be used very generally, equipment intended to meet much simpler conditions and requirements than those imposed by the new tools when working at their best. It does not seem necessary to consider here, in detail, the advantages in the use of machine tools designed specifically to secure the highest efficiency through the greatest possible rapidity of production. Such advantages may be taken for granted. The purpose is to point out briefly some of the elements in the design of such machine tools, tending to secure those conditions which make for maximum effect.

Until recently the primary consideration in machine tool design seems to have been facility in operation and manipulation. Naturally this is desirable, even important; and levers, wheels, and similar devices for regulating the various movements of the tool and machine parts need to be, generally speaking, within convenient reach of the operator. As to the moving parts themselves, the present day possibilities of specialization, subdivision of labor, in manufacturing processes, eliminate to a considerable extent the necessity for a multiplicity of movements of parts, or great variety in possible speeds, except in those cases where a machine is installed for the express purpose of doing a wide range of work. It stands to reason that the more moving parts there are, the more joints and slides and screws, the greater becomes the difficulty of eliminating play and of securing maximum rigidity.

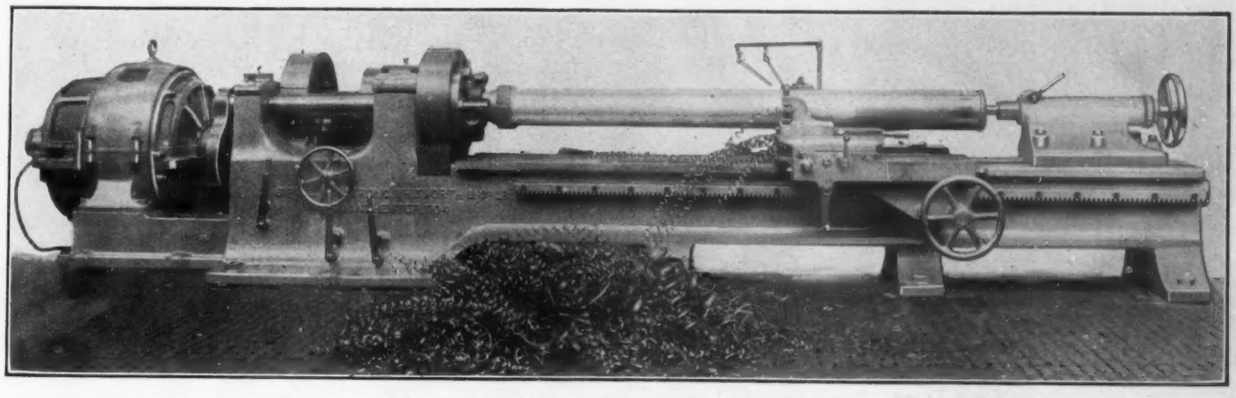
Massiveness is but one of the elements which go to make up a machine rigid enough to stand up to the work of which modern high-speed tools are capable. The greater the amount of metal in the machine body, the better it absorbs shocks and vibration. A much more important element in design, however, is the proper distribution of the metal so as to secure not merely absorption of, but to the greatest possible extent also the prevention of vibration. For vibration, commonly considered only with reference to the effect upon the accuracy of the work done, has an even greater effect upon the tool itself.

The life of a cutting edge of a high-speed tool, assuming it to have been properly hardened and tempered, depends chiefly upon two factors—the heat generated at, or rather absorbed by, the cutter at the place where the cutting is done, and the nature and extent of the vibration present. With the first we are not at this time concerned, since this depends upon such things as the nature of the material under operation, the cut, feed, and speed. The vibration, apparently never entirely absent even in the most solidly and rigidly constructed machines, permits the cutting edge to be battered and splintered away more or less rapidly according to the nature of the vibration. Under the very best conditions the tool, holders, frame, and piece worked upon, and whatever other intervening parts there may be, form a sort of spring under tension. The fluctuations in pressure at the tool point, attendant upon cutting operations,* tend to modify the tension from moment to moment, so that vibration is likely to take place, considerable or inconsiderable according to the conditions.

Reduction of Parts Desirable.

It has been shown that a multiplicity of parts intervening between the tool and the piece worked upon not only increases

*For want of space it is impossible to discuss here the nature of these pressure fluctuations or their cause. They are elaborated sufficiently to satisfy the interest of most readers in my shortly forthcoming "The High-Speed Steel Book," to which those interested are referred for further information.



High Speed Gun Lathe by Armstrong Whitworth & Co. Motor-Driven and Capable of Heaviest Cuts.

the possibilities for play between the parts, but tends to increase in the length of the spring, and consequently the extent of the vibration. The desideratum is as few moving parts as possible; and these so fitted to each other as to afford a maximum bearing surface for each. To shorten the arc as much as possible, the tool must be brought as close as may be to the bed or frame of the machine. In the case of a lathe, for example, the lower the tool is set—that is, the flatter the saddle and slides or turrets, the better the design for high-power and high-speed work. Beds or frames corresponding in width to the size of the work required, therefore are necessary, not only to avoid overhang, but to permit low saddles or carriages and tool supports. The advantages in low turrets and tool holders of other sorts, cannot well be over emphasized.

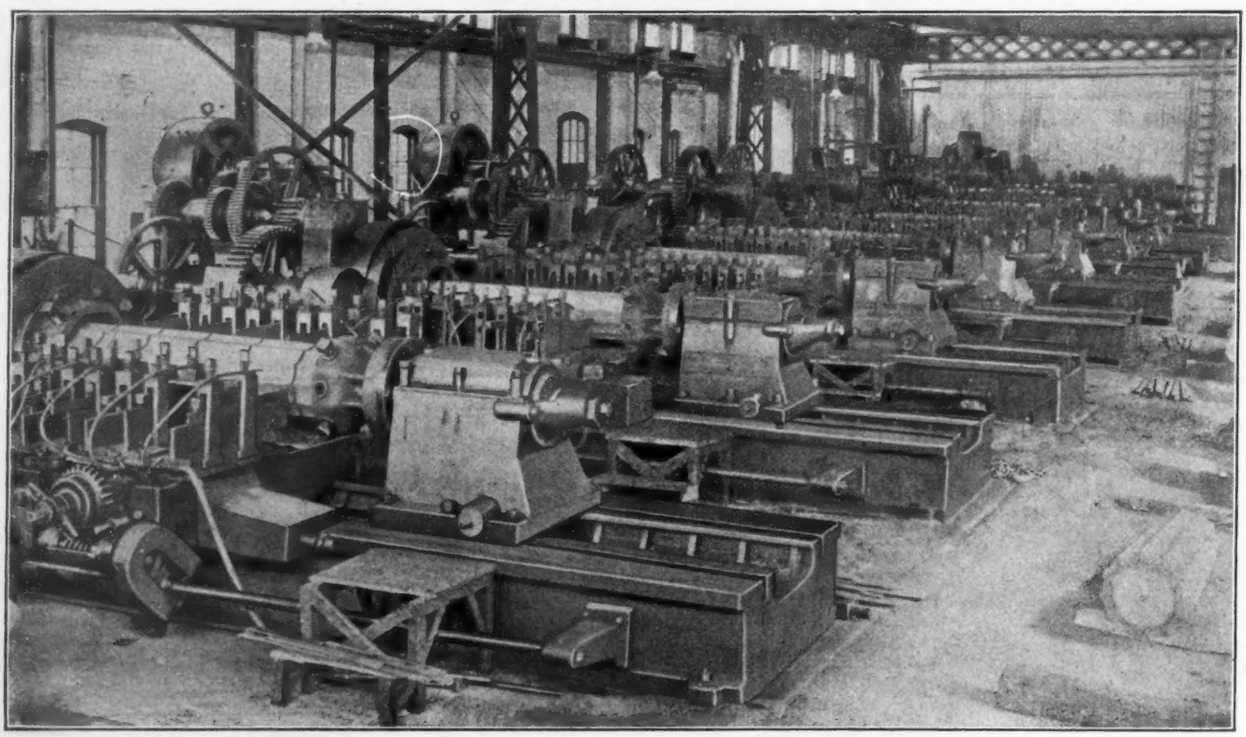
Usual Position of Tool Unnecessary.

It is by no means essential, as one might suppose from the persistence of that feature in machine design, that the tool shank must be horizontal to the bed and at a height corresponding, in lathes, to the centers. The low tool slide and oblique tool position when this is necessary, are entirely feasible. Likewise, in the case of planing machines, the least torsional strains affect the cross rails when the cutting point of the tool is nearly in front of the rail rather than below it. In the same manner, that milling machine is best adapted to high-speed cutting, which has shortest arms and holds the cutters closest to the main frame. The unusually sharp angles in the cutting tools used in the Lo-Swing lathe and machines of similar design, is due in large measure to the low tool position, flat saddle or slides with movements reduced to a minimum, and an exceptionally rigid bed. Such sharp angled tools, when conditions permit its use as in machines of the class just mentioned, reciprocally reduce the pressures and consequent strains, and insure better work with lowered power consumption.

The elimination of unnecessary joints raises the question as to the attachment of head or arch to the bed or frame of a machine. Obviously the most rigid and solid arrangement would be that where the whole framework, that for carrying the moving parts as well as those supporting the work, is in a single piece, cast as a whole. In small machines this is often feasible, though it rather complicates the problem of making good castings, and is less frequently resorted to than apparently it might be. In large machines, at any rate in very large ones, the trick manifestly is out of the question; though in the case of lathes there are examples of such one-piece bed and head machines of considerable size. I have seen a powerful machine of this type, as used at the Armstrong-Whitworth Works, and there are several American designs now in the market. Even the base or support for the motors are cast solid with the beds. So far as I am aware no one has yet attempted to get around the difficulties of casting very large machines in single pieces by resort to electrical or autogenous welding. It would seem that these processes, so successfully applied in other directions, might be practicable also in machine building—not only in connection with the particular matter just referred to, but in making it possible to better distribute material than is customary without at the same time complicating the problems of producing the castings. Might not frames be cast in sections, and afterward welded together into one single piece? I should like to see it tried. The distribution of material has much to do with the rigidity of a machine, no matter how heavy it may be. It is well enough known, I suppose, that a hollow cylindrical section offers greater resistance to strains than any other distribution of material. The hollow rectangular prism also is a superior form for resistance to torsional strains especially.

The Conventional Bed Undesirable.

There are certain types of machines wherein advantage is taken of the cylindrical and rectangular sections to some extent, notably in drilling machines and certain kinds of milling machines; but I am not informed of any lathe beds, or planer rails, or similar parts where these sections are regularly used. There are, it is true, a good many approaches to these forms, most of them very well in their way, and possibly less clumsy or more convenient that they might otherwise be—but why not the best form? The conventional lathe bed con-



MOTOR-DRIVEN INGOT SLICING LATHES. CHARACTERISTIC USE OF MULTIPLE TOOLS.
MIDVALE STEEL CO.

sists essentially of two I beams joined at intervals by girts—really the least advantageous distribution of material: though it must be said in justice that there are plenty of excellent, even extremely rigid, machines made on such lines. It would be interesting to see a machine built entirely on the box or cylinder idea. Manifestly all ways, guides, supports, faces for fastenings, and the like would have to be external; for slots would be impossible without destroying the real form and at the same time its strain resisting power. A little experiment with a pasteboard or paper cylinder, twisting or bending it before and also after a slit has been cut into it shows very well what happens.

Motor Drive vs. Shaft Drive.

It should not be inferred that economy of material is advocated. On the contrary it is desirable that the weight be ample to absorb vibration to the maximum extent. At the same time the greatest possible advantage should be taken of the material utilized, to secure a maximum of rigidity, which of itself will eliminate vibration to a large extent and thus add not only to the life of the machine, but to the efficiency of the tool.

Very considerable modification, and even entire rejection, of methods and devices for driving, have been necessitated by the new conditions. The multiple step cone driving pulley is impossible, for reasons quite obvious—the impossibility of devoting the space required for crowns broad enough to meet the requirements of belts of sufficient width to deliver the necessary power, saying nothing of the difficulties and dangers attendant upon changing swiftly flying belts such as are requisite to high-speed service. Three steps are about as many as anybody now tries to utilize; and two seem to be more frequently found on the best machines of recent design. The disposition apparently, and properly, is toward a single driving pulley (in the case of belt driven machines) in connection with change gear boxes or variable speed countershaft, or both where required.

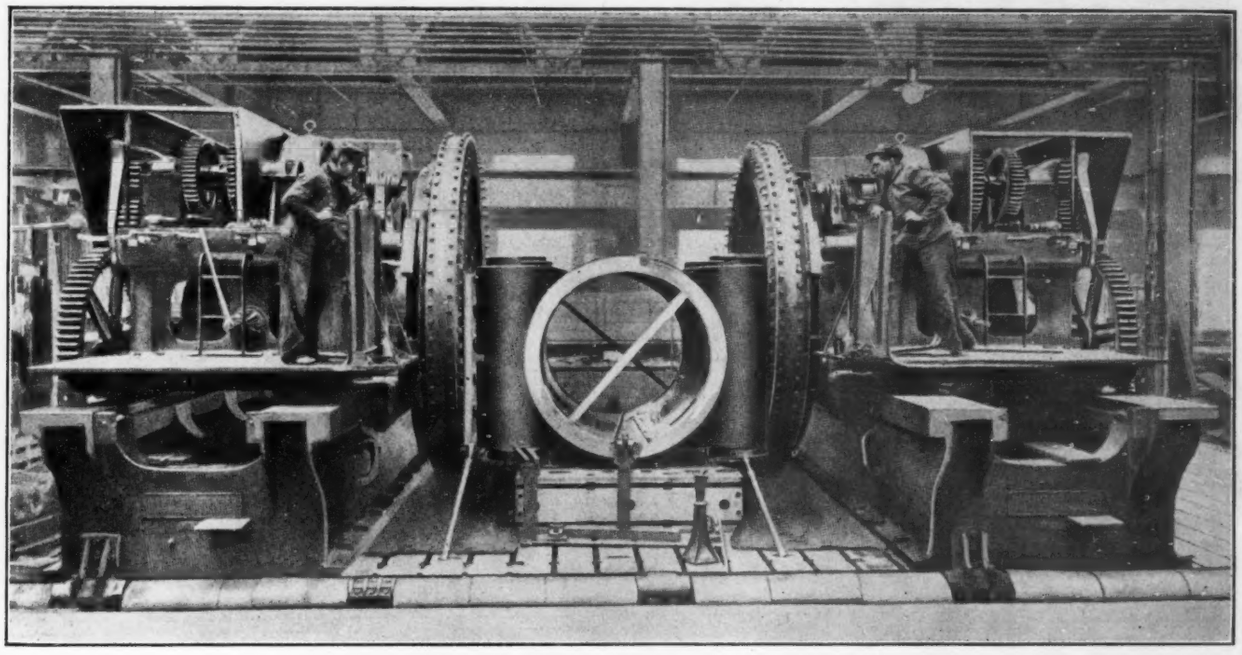
There still exists difference of opinion as to the economy or advantage of the direct motor drive for machine tools; but I believe it is pretty generally conceded that in the case of machines designed for high duty, the motor drive is the most efficient. Certainly it does away with belt trouble and dangers and affords a positive drive, which latter is highly desirable. The power lost in line shafting transmission, frequently quite ignored, is actually a big thing, relatively; and almost universally is under-estimated. (See Iron Trade Review Dec. 23, 1909.) Under the new conditions, wherein usually increased weight and speed are required in belts as well as in shafting, the losses are relatively much greater, aad the motor drive becomes all but essential to all big machines. Even the group drive, by motor and short line shafts, can scarcely be considered except where the machines are only of moderate size and can be so placed as to avoid dangers from the belts, and other troubles incident to this mode of driving.

The method of applying the motor and the drive to the machine requires serious attention. The separate motor, attached to floor, ceiling, or other convenient place of support, and belt or chain connected to the machine, evidently is less desirable than a direct connection. There are examples of motors forming integral parts of machines, the motors being mounted upon, or rather built around, the driving spindles; and this evidently is the most effective method where the necessary speed variations can be secured in this way. Otherwise it is necessary to mount the motor upon bases forming integral parts of the machine frame, and connect up through gears or short chain transmission. The attachment of motors to machines by bracket extensions and similar devices not insuring the greatest rigidity, is to be avoided. Some of the earlier attempts to apply motors to heavy machines without essential modification of the design, were quite laughable.

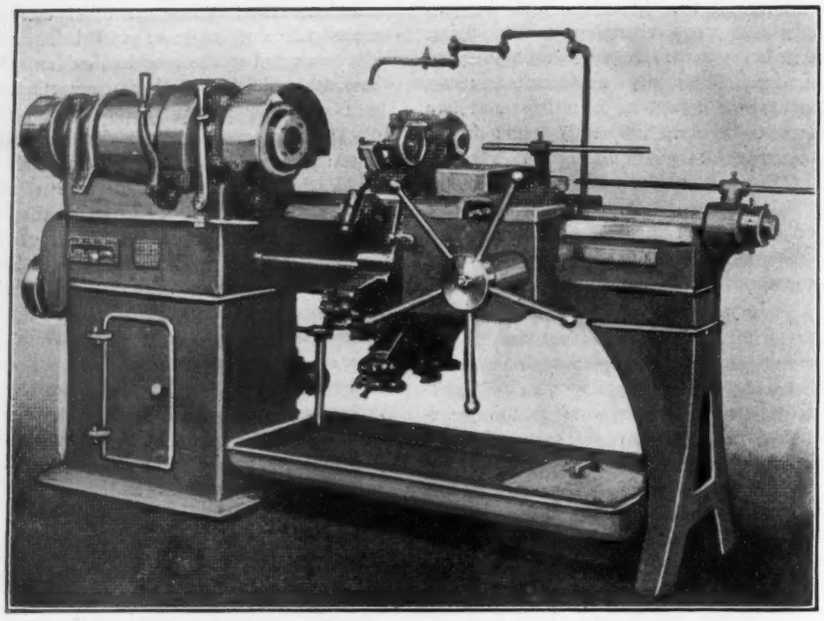
Cast Iron Gears Abandoned.

Whether a variable speed motor, with speed changes enough to take care of all the variations required of any particular machine, is sufficient without the intervention of a speed changing gear box; or whether a single speed motor in connection with the speed changing gear is to be used, of course depends considerably upon the nature of the machine and the work called for. The multiple speed motor has been developed within the last very few years into a practical and efficient machine, and where its use is feasible does away with complications in the driving head of the machine which might well be avoided if possible.

Few builders of high power machine



Large Rotary Planing Machine, Diameter of Cutters 10 Feet.

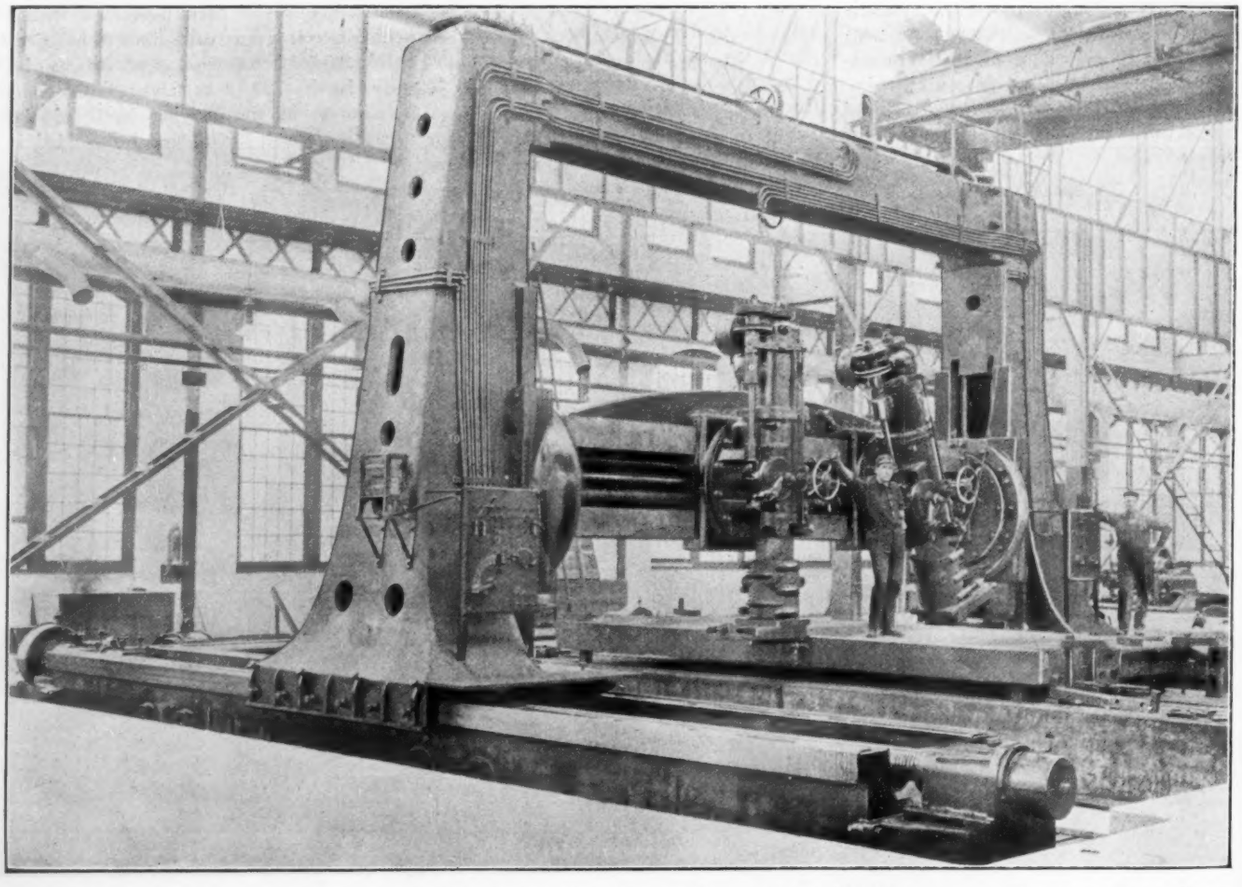


AN INTERESTING FORM OF MULTIPLE TOOL MACHINE WITH SOLID BED AND HEAD. GIVING MAXIMUM RIGIDITY WITHOUT SACRIFICE OF MOTILITY.

tools now attempt to use cast iron gears. To give the required factor of safety, these would have to be too clumsy, ordinarily; so that bronze or steel gears only (or, in case of the smaller diameters, sometimes built up of rawhide or similar material and suitably re-inforced) are feasible. The possibility of accident such as might result in wrenching the machine, suggest that shearing pins or other safety devices should be provided.

Not only the main drive gears, but those effecting the subsidiary drives, must be equal to any possible demands. It must be remembered that the feeding stress may at times, under abnormal conditions of course, say like the use of a dull tool, be quite equal to the driving stress. The mechanism for effecting this and other movements therefore must be adequate to meet just such possible exigencies. A good braking device also is desirable in a high-speed machine, to that it may in emergency be quickly brought to a stop.

The amount of power required for the auxiliary drives almost, if not quite, precludes the use of belts for this purpose. The silent chain is perhaps permissible, though not always feasible and certainly more cumbersome than gears. In very heavy machines the tendency appears to be to get away, as far as possible, from the complications involved in taking the auxiliary drives from the main drive, the latter being effected through smaller motors so placed as to insure convenience, simplicity, and to minimize transmission losses and strains. The advantage of this method is strikingly illustrated in the immense planing machine built a year or two ago by the Niles-Bement-Pond Company. This machine, as I recollect, is equipped with

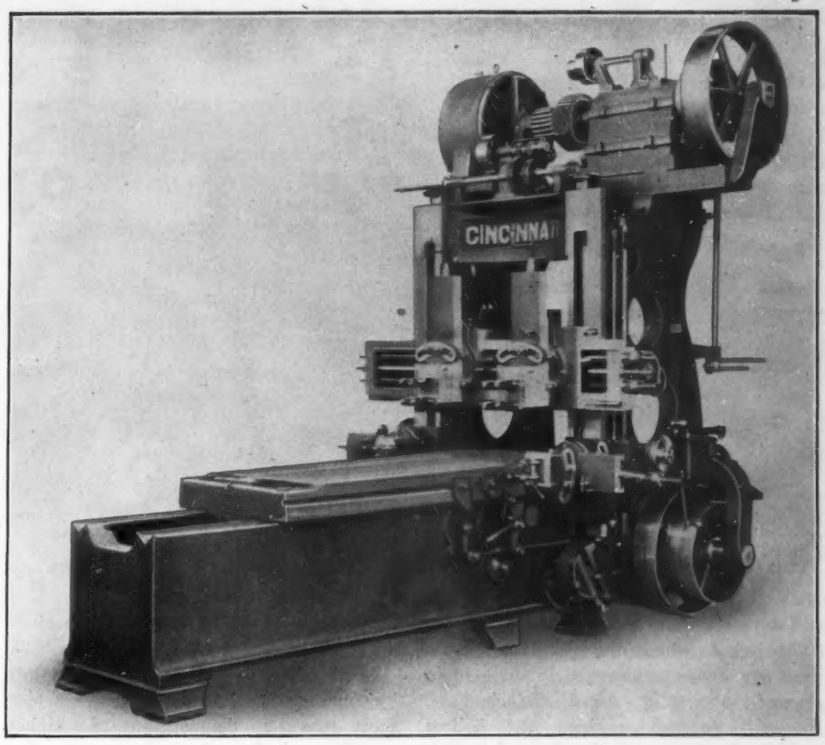


A 12-FOOT PIT PLANER. ONE OF THE LARGEST MACHINES EVER BUILT. WEIGHT OVER 500,000 POUNDS. FINISHES FOUR EDGES AND ONE FACE OF 24 x 12-FOOT x 12-INCH ARMOR PLATE AT ONE SETTING.

four motors in addition to the 100 horsepower main drive motor. Such an arrangement makes each of the subsidiary movements of the machine independent of the main drive and of the others, and permits it to do work otherwise not possible. In this particular machine, for instance, cross planing and slotting can be done effectively, thus allowing tops, ends, and sides of pieces to be machined at a single setting—a highly important item in big work. I have seen powerful slab milling machines also equipped with one or more supplemental motors; and there are examples of lathes driven by at least three independent motors.

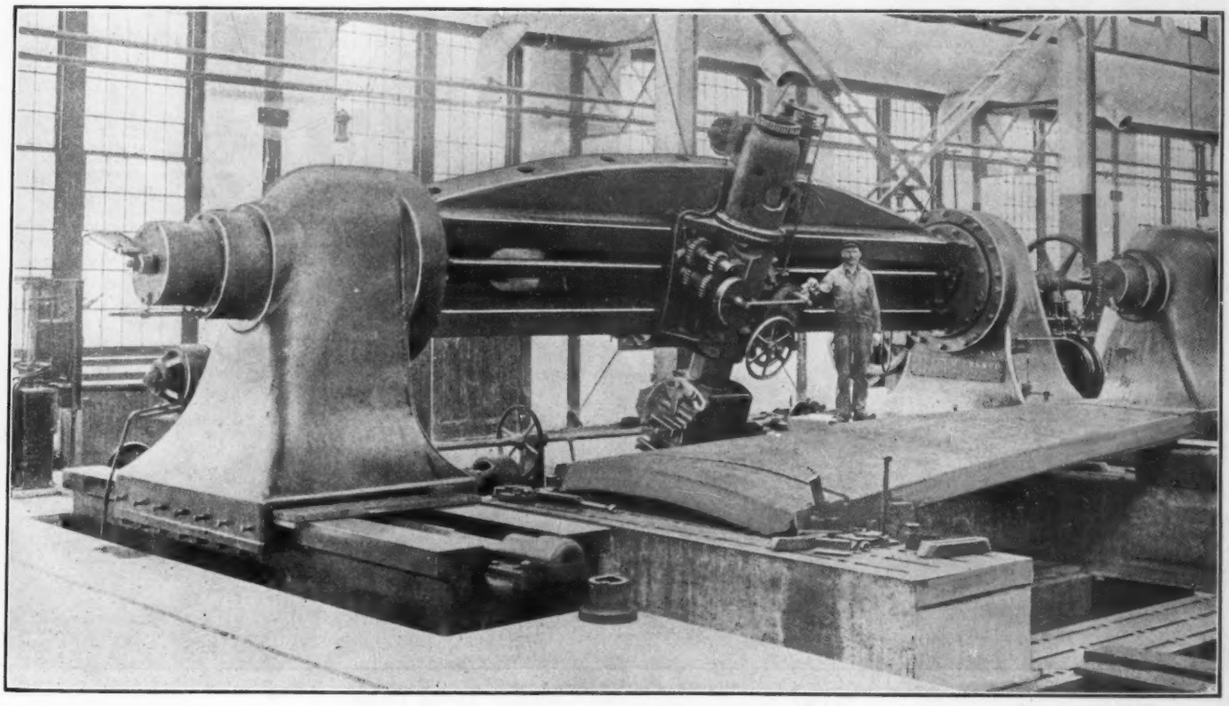
Perfect Lubrication Necessary.

Properly proportioned bearings, and suitable and certain means for lubricating them, are much more important than heretofore. Not only is the increased speed to be considered, but also the very greatly increased pressures to which bearing parts are subjected. To meet these conditions, bearing surfaces must be large, and of material best calculated to resist wear and minimize friction. Considerations of space as well as of rigidity make it preferable that the augmentation of bearing surface should result from increased diameter rather than greater length. Perhaps it were better to say it should result from a combination of increased length and diameter. The latter permits, generally, the use of hollow spindles, which again tend toward greater strength and rigidity, and allow the better use of gears in the driving mechanism.

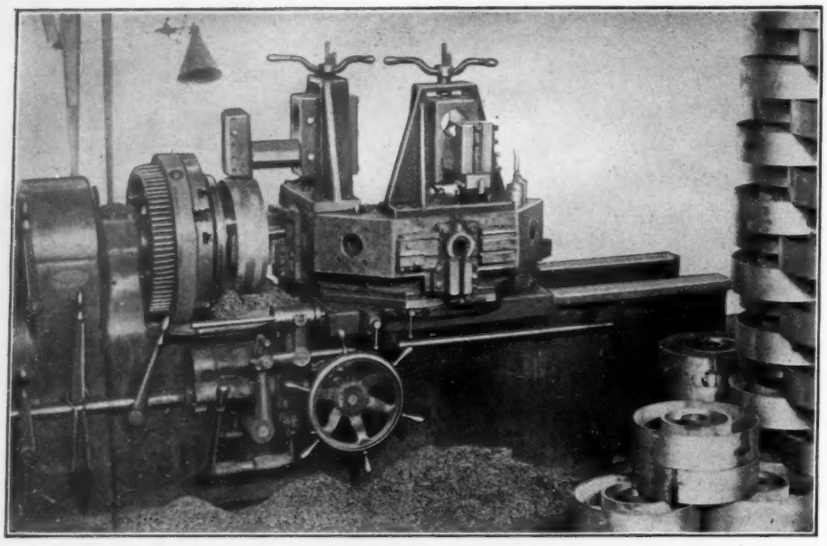


An Exceptionally Heavy Though Small (37-Inch) Planer. A High Power and High Speed Machine.

The new conditions seriously affect the problems of lubrication. It is necessary in many, if in not all cases, to provide means other than the usual gravity oil cups, that lubrication may be both free and certain. Pumps and other, but more special, devices, are used for this purpose. An ingenious example is that employed in one make of lathe wherein the bearing is surrounded by an oil filled well. Oil is continuously dipped up by a suitable cup arrangement attached to the spindle, and after being carried to the highest point is distributed by gravity, through channels cut in the bearing blocks for that purpose. A glass tube inserted at the front serves as a level indicator. Another device,



A Motor Driven Breast Planer, for Armor Plate Work. Tools Cut in Both Directions. Finishes Four Edges at One Setting.

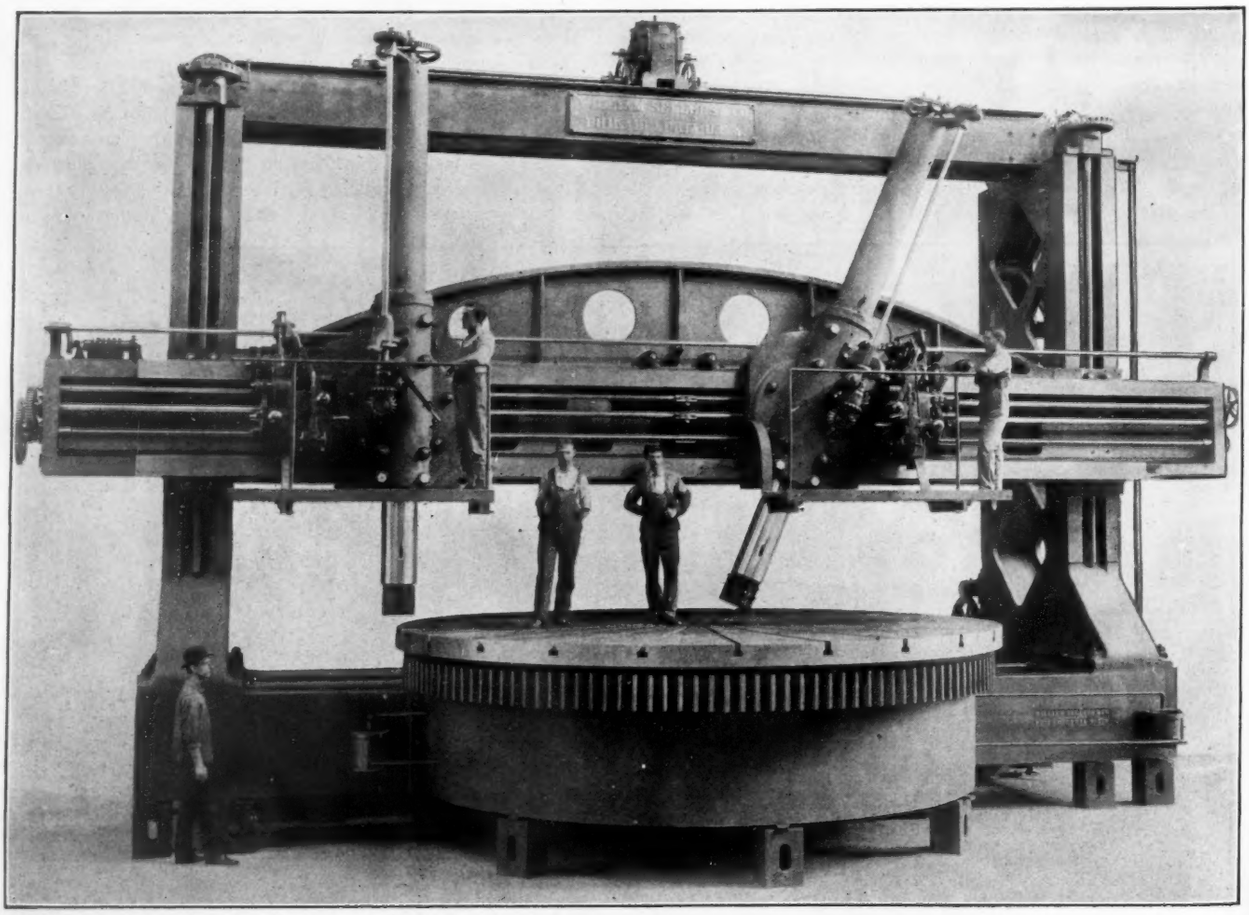


TURRET LATHE WITH LOW RIGID TURRET AND ACCESSORY TOOL HOLDERS. NOTEWORTHY USE OF MULTIPLE TOOLS.

rather more simple, is that of the Hartness lathes, where the gears and bearings are partly submerged in oil held in a pan formed by the headstock base. In still another machine the hollow spindle forms an oil chamber. In other cases, those of very heavy machines, oil is sometimes forced into the bearings by small pumps.

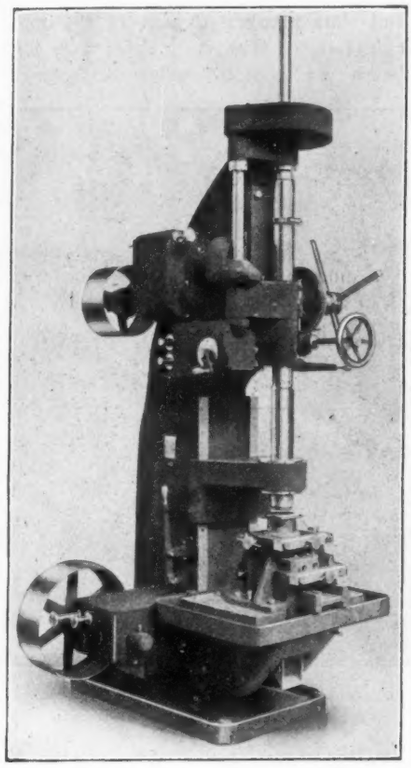
Much attention has been given of late by makers of reciprocating machine tools to the development of higher speeds; and there have been a number of innovations making for increased effectiveness, in the way of eliminating belts, use of improved clutches and reversing gear, multiple speed and quick return devices. The elimination of belts is a consummation for which we may be duly grateful; and the quick return and multiple speed possibilities help some. The reciprocating machine however has one inherent weakness, which ever must limit its usefulness and circumscribe its efficiency and that weakness is the circumstance that it is a reciprocating machine. Even if it were practicable to take a cut both ways, that is, on the return as well as on the forward stroke, a gain of 100 per cent over present regular practice, there would still remain the condition which positively limits speed—the necessity for stopping and reversing with each stroke. Everybody knows that there is an immense waste of power in thus arresting momentum and immediately starting again into the work with an abrupt augmentation of speed. Even the device whereby speed in taking the cut is gradually accelerated does not avoid, though does reduce, the shock of the tool striking against the work.

It is maintained that, in spite of the inherent weaknesses, planing, shaping,



A 20-FOOT BORING MILL WITH AUXILIARY MOTOR DRIVES.

slotting, and the like form of machines, have a field of usefulness peculiarly their own. Possibly. But if so, it seems to me the jobs which could not be better, or at least as well, done on a rotating machine, are comparatively few—if indeed there are any such. The incomparably greater efficiency of a rotary cut, as compared with a reciprocating, certainly would indicate the use of the former wherever possible. I do not now recall seeing any job except possibly the finishing of internal angles which rotary cutters of the usual type could not get at. The recent development of tools for boring rectilinear holes



A Modern Drilling and Boring Machine for Heaviest Duty.

seems to put even such jobs in the class of those possible on rotating machines.

However that may be, certain it is that the development of the rotary planing machine, the cold saw, and the planer type of milling machine has been going on apace, and though the days of the reciprocating tool may not be numbered, the day of its rivals certainly is here.

The use of portable machines, in connection with floor plates, has been common for a number of years in shops handling large pieces. The setting of such large pieces, not infrequently heavier than the machines themselves is a matter of concern; and it is often easier to move the whole machine, bringing it to bear upon the part to be machined, than to move and reset the piece. Similarly, even where the floor plate is unnecessary or unavailable, it may be desirable to move the tool rather than the piece to be machined. There has on this account come into existence a type of machine not related directly to the lathe, in which the tool carrying parts move rather than the beds carrying the work. Such is the pillar and pit planer, and the related form of milling or boring machine. In some instances several functions are combined in a single machine; and this is of course desirable wherever the machine is to be used for a variety of work and the combination does not greatly complicate the mechanism. Such an arrangement not only economizes in respect of moving and setting the piece, but often permits the performance of several operations simultaneously through the use of multiple heads. Of course multiple heads also are possible, and in use, in the common type of machine; but the number of operations is necessarily limited.

Everywhere, in the machine tool line, the tendency is toward the adaptation of existing type forms to special conditions. High-speed tools have opened the eyes and minds of users and designers as they have never been opened before, to the possibilities of specialization in machines; and standard forms, adaptable to wide latitudes in their applications, are more and more passed by for machines intended to specific performances with maximum effect. It is progress, it is the industrial spirit manifesting itself in maximum efficiency.

PREVENTION OF ACCIDENTS ABOUT ELECTRICAL MACHINERY.

In a communication to the *Electrical World* on the above subject, Robert J. Young, safety inspector of the Illinois Steel Co., makes some suggestions which should have general observance. After classifying the risks to which those working with or about electrical apparatus are exposed, under four heads, i. e., (1) those attributable to shocks, meaning injury from the passage of current through the body; (2) those attributable to burns or injuries due to a contact between some portion of the body and an electric arc; (3) injuries to the eyes from exposure to intense light; (4) those attributable to falls caused in the first instance by shocks or burns. Mr. Young adds, that no work should ever be done upon aerial high voltage transmission circuits, or upon apparatus connected with them, unless the power is cut off absolutely, and that it is a common thing for line workers to renew insulators, cross arms, etc., while high tension current is flowing through the wire. From the suggestions referred to we take the following:

"Safe disconnecting means should be arranged so that switchboards or switches may be rendered 'dead' when it is necessary to work on them. The enclosed fuse or automatic overload circuit breaker should be used on all mill-motor circuits. There should be insulating mats at all boards.

"All motors should be thoroughly grounded. Where the motor is so located that men work around it, the armature shaft, if it projects beyond the housing or the brake wheel, should be guarded. A convenient way to do this is to place a cup over the end of the shaft, fastening it to the housing or frame work of the motor. It should not be allowed to turn with the shaft. This shaft end has been found to be a prolific cause of accidents.

"One of the most productive causes of accidents is the overhead traveling crane. All overhead cranes should be provided with a railed walk the entire length of the bridge. It seems strange that manufacturers would build cranes without these walks, but they do. These cranes should also be equipped with foot gongs for the use of the operator; with a box on the bridge in which to keep tools and oil cans, and with limit switches to prevent running the hoist blocks into the drums and probably breaking the cables, allowing the burden to fall on to workmen below.

"Each crane should have a switch installed at some point on the bridge which will cut off all power, making it impossible to start the crane from the cab. Many men have been injured while working on the top of a crane by a thoughtless craneman forgetting for the moment that they are there and starting the machinery.

"Each man working on a crane should be provided with a warning sign bearing his name, which he should attach to the safety switch, warning all not to throw in that switch as he is working on the machinery.

"All overhead cranes should be equipped with sweep brushes extending out from the truck wheels, sweeping the rails, the purpose being to warn a person resting his hand on the rail of the approach of the crane.

"No man should ever be allowed to go on to an overhead crane runway without permission from his foreman, and then not until the cranemen have been notified and steps taken to protect him from the cranes while he is on the runway."

THE COLBURN NEW MODEL BORING AND TURNING MILLS.

It is not often that we have the opportunity to present a new design which embraces an entire line of sizes in a machine tool, and the illustrations and description of the new vertical boring and turning mills of which the Colburn Machine Tool Co., Franklin, Pa., has just brought out an entire line, will be of interest. There are five sizes in the line, as follows: 42, 48, 54, 60 and 72-inch swing. With the exception of the method of driving the table, the same features are incorporated in all sizes and a description of any one size practically describes all the others. To distinguish these new mills from others, the name "New Model" has been adopted. All sizes are built with two swivel heads, and the three smaller sizes with turret heads as desired.

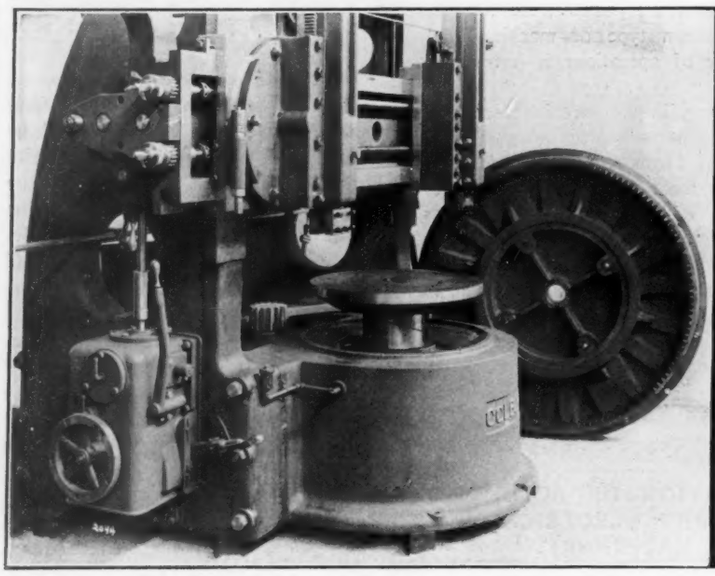


FIG. 1.

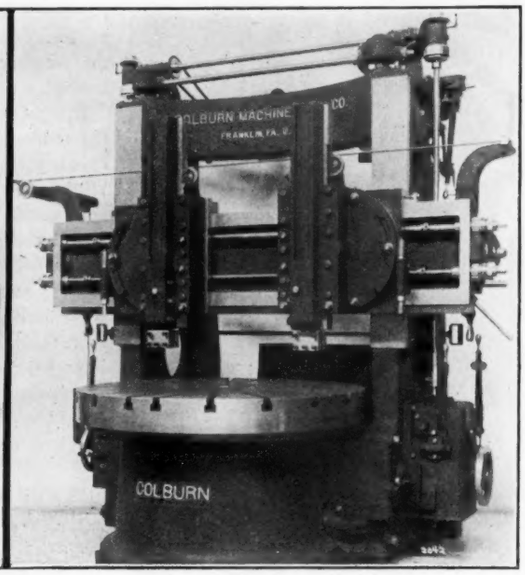


FIG. 2.

Referring to Fig. 1, it will be seen that the table and spindle are carried on and centered by a broad coniform bearing which, together with the large parallel vertical bearings, effectually resists all working strains. The spindle bearings are lubricated from one sight feed oil cup seen in the photo and on which the proper height of the oil is always shown by a mark on the glass. The lower part of the conical bearing is immersed in a reservoir of oil which in operation is carried upward to the outer edge of the bearing to an annular channel from which it is returned through suitable grooves and the bearing is thus automatically constantly flushed with oil, which also flows over to the vertical bearings where a felt ring set into the top of bearing retains enough to keep the bearing lubricated for some time independent of the cup.

The table is driven by a spur gear attached directly to the table itself, an external spur gear being used on the 42, 48 and 54-inch mills, and an internal gear as shown in the illustration on the 60 and 72-inch.

The drive is by means of five step cone pulleys, thence through the speed box which contains the back gears and positive clutches which are constantly immersed in a bath of oil. The back gears are engaged and disengaged by means of positive clutches inside of the speed box and operated by lever *Z* at side of machine as shown in Fig. 3. Five speeds are obtained with the back gears out, and five more with the back gears in, all in geometrical progression. The speed box when assembled is perfectly oil tight and the proper height of oil shown by the sight feed cup. All the bearings have phosphor bronze bushings with ring oilers to which the oil runs directly from the main reservoir. By removing the plug under the sight feed oil cup, the entire box can be drained. For convenience in making repairs, the speed box can be quickly removed from the machine in its entirety, and every part is then accessible.

The belt shifter furnished on these mills, the builders say, is so simple, effective and easily operated, that the need of a one belt drive is entirely eliminated. By means of this shifter, operated entirely with one hand, the belt can be changed from one step of the cone pulley to another with wonderful rapidity and without the slightest injury to the belt. It is claimed that in actual operation the entire range of speeds obtained with the cone pulleys, from the slowest to the fastest and back again, stopping momentarily on each step, has been made in eight seconds. A speed index plate directly above the back gear lever *Z*, indicates the step on cone pulley and position of clutches in speed box to give the correct speed of table in revolutions.

The countershaft, as seen in Fig. 3, is attached directly to the upper part of the housings by means of brackets and thus becomes a part of the machine itself. The main drive belt can be shifted from either side of the mill by means of a horizontal rod having a spade handle at each end.

To enable the operator to readily stop the machine, a friction brake is furnished which is operated by a foot treadle placed within easy reach at the operating side of machine, as shown in Figs. 2 and 4. The brake is applied to the inside of the lower driving cone pulley (see Fig. 3) by means of a taper friction with hard maple shoes or wedges. The conical type of friction avoids strains on bearings and the braking effect is instantaneous. In actual operation it is claimed that the mill can be stopped and started, all the table speeds changed, back gears thrown in and out and the foot brake applied without the operator leaving his position at the side of the machine.

The cross rail is of the box type with deep arched back and of massive

proportions and is raised and lowered by power. The saddles have liberal bearing surfaces with adjustable taper gibs to compensate for wear. The swivels are of large diameter and the metal over the T slot is extra heavy to withstand clamping strains. Angular adjustments are made by worm and gear. The rams are of very stiff design and have inset steel racks and cored openings which extend clear to the top so that extra long boring bars can be used. The rams can be housed entirely within the guides so that the bottom of tool holders will be above the lower edge of cross rail.

The feeding mechanism for each head is contained in a separate case, one on each side of the mill. By turning the handwheel marked in Fig. 3 one revolution five changes of feed are obtained; a movement of the multiplying lever changes the combination of gears, and another revolution of the handwheel gives five more changes, or ten in all. The usual slip gears on the ends of cross rail feed rods and screws are eliminated, and quick adjusting positive serrated clutches are substituted which enable the operator to instantly change feeds from vertical to horizontal and vice versa. Either feed can be reversed instantly by the feed reverse lever shown at each end of the rail.

Rapid traverse of the tools, in horizontal, vertical, and angular directions is obtained from the same vertical shafts as the feed, the manipulation being by a vertical lever attached to the front of the feed case, marked "Rapid Traverse Lever" in Fig. 3 and which has two operating positions; forward and back. The gear feed is always engaged when the lever is in the back position and the tool will feed in the direction determined by the position of the feed reverse lever at the end of the cross rail; the rapid traverse is always engaged when the lever is in the forward position and the tool will travel rapidly in the opposite direction from the gear feed. It is thus impossible for the operator to throw the rapid traverse in the wrong way, and there is no chance for an accident to occur, a point of which the value will be freely conceded.

This arrangement of gear feed and rapid traverse simplifies the whole process of rapid manipulation of the tools, and makes a safety device which is not only theoretically but practically fool proof.

The motion for the rapid traverse is obtained from the upper horizontal shaft through friction cones having cork inserts and the rapid traverse, in connection with the final adjusting collars, does away with the necessity of hand cranking, although the ends of the rods and screws in cross rail are squared so that a crank can be used when preferred.

Although the rapid traverse is an indispensable feature, enabling the operator to quickly move the tools in any direction, it does not allow a fine adjustment to be made. To accomplish this it has usually been necessary to go to the end of the cross rail and make the final adjustment by means of a crank handle.

This is unnecessary on the Colburn new model mills. Both feed screws and rods in the cross rail are splined and each has a capstan collar feathered thereto so that by turning the capstan collars with a small lever furnished for this purpose, the operator can stand close to his work, and make the finest adjustments of the tools in any direction without leaving his position. These collars are a real convenience and can be readily seen in Figs. 1, 2 and 4.

A safety shear pin device placed on the rear of each end of the cross rail prevents injury to feed mechanism in case the heads are accidentally run together or from other causes. This device is indicated in Fig. 3. The horizontal shaft which transmits the motion of the vertical feed shaft through bevel gears to the train of spur gears at the end of the rail and thence to the heads, is made in two sections with a little flange coupling. Motion is transmitted by a small pin which passes through each flange of the coupling. Any abnormal strain on the feeding mechanism in excess of that necessary to make the heaviest cuts will shear this pin off and thus protect the gears and mechanism from breakage. The whole operation

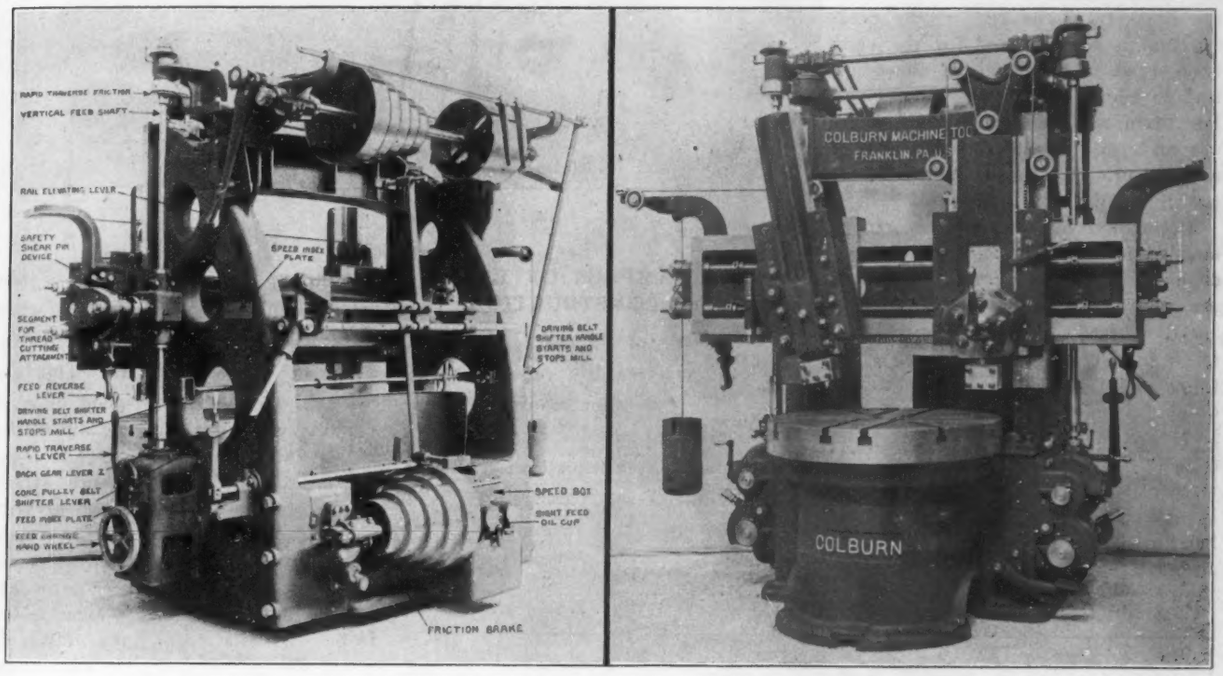


FIG. 3.

of taking out the old pin and putting in a new one only takes a few seconds. The pins are made from ordinary wire nails which can be found around any shop.

When cutting threads the feed change handwheel is set so that the vertical feed shaft and table revolve in unison. A single tooth clutch on the lower end of this shaft insures the threading tool always catching the thread in taking successive cuts, and the rapid traverse device is used to return the tool quickly to its starting point.

The thread cutting attachment is not furnished regularly, but can be put on at any time. It is attached to the bracket on the end of the cross rail and is always used for the right hand head. Change gears allow any lead to be cut from 2 to 14 per inch. For drum scoring special arrangements are made which allow leads as coarse as one turn in 2 inches to be cut as readily as the finer pitches.

A constant speed motor is recommended for these mills, since the mechanical belt shifter and clutches in the speed box give all changes of speeds desired. The motor is mounted on a bracket at the rear and belted to a pulley on the countershaft. In order to enable the operator to stop and start the mill without stopping the motor a clutch pulley replaces the regular tight and loose pulleys, and is operated by the same levers with handles on both sides of mill. Fig. 4 shows a 42-inch mill with one turret head.

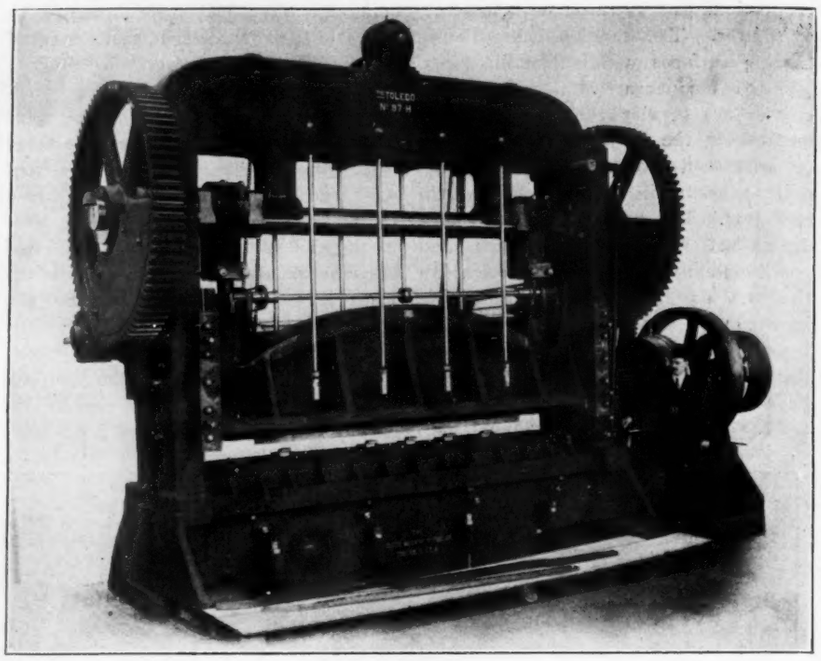


FIG. 1.

TWO EXAMPLES OF LARGE PRESS CONSTRUCTION.

The growth of all-steel construction in motor vehicles has called for the construction of some unusually large presses, and we present herewith illustrations of two examples designed and built by the Toledo Machine & Tool Co., Toledo, O., for forming steel automobile bodies and frames. The press shown in Fig. 1 is intended for forming up the sides and cross-channels for automobile underframes, which work has heretofore been chiefly produced in hydraulic presses. This machine is operated at a speed of eight strokes per minute, and the illustration shows the dies in position. The lower die is fitted with a pressure attachment capable of exerting a pressure of about 500 tons for the prevention of distortion in the strip while being formed. The ram pressure of the machine is about 900 tons. What is said to be a novel feature is the motor elevating attachment for slide adjustment, made necessaary by the great size and weight of the slides. The attachment is operated by a 4-horsepower motor mounted above the arch, the powe being transmitted through the rear shaft to the worm gears on the pitman screws by sprocket chain. A reversible friction clutch, not visible in the photo, is provided for this attachment and controlled by a lever at the hand of the man in the illusutration. The press is fitted with the twin gears customary in large press work, and a powerful friction clutch, which gives the operator complete control of the movement of the machine. The crank shaft gears are 86 inches in diameter, 10 inch face, and the total gear ratio is 40 to 1. The stroke is 8 inches, and the horsepower required for operating about 40. The width between housings is 14 feet 4 inches; height from floor line 15 feet; depth below floor line 24 inches; floor space 9 feet 4 inches by 25 feet 10 inches

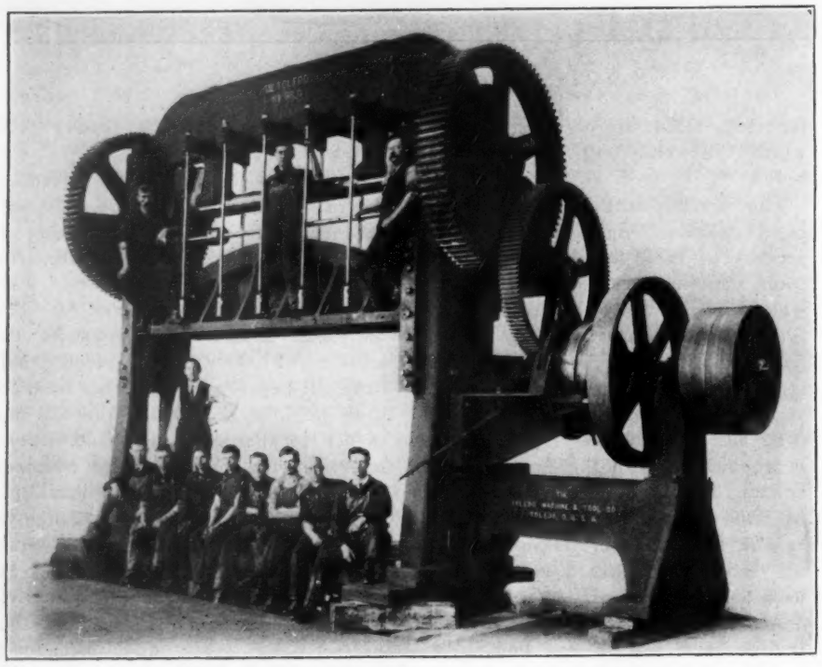
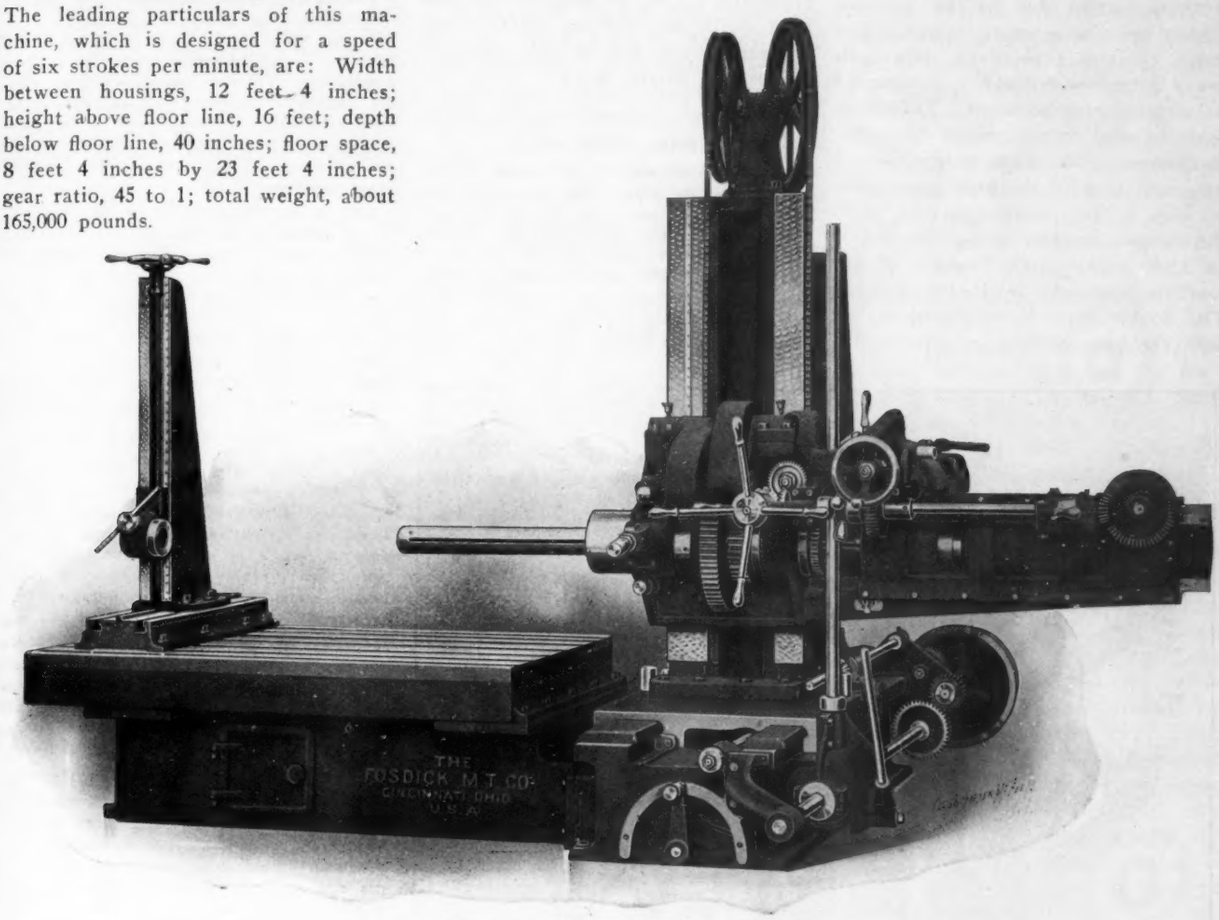


FIG. 2.

The complete weight of the machine as shown is about 185,000 pounds.

In Fig. 2 is shown a machine designed for pressing automobile bodies, which calls for unusual die space. The stroke of this machine is 24 inches. An additional sub-base, not shown in the illustration, is supplied for attachment to the upper side of main bed, reducing the die space to that suitable for ordinary work, and will accommodate the same bed plate or bolster as the main bed, which is also true of the drawing attachments. The leading particulars of this machine, which is designed for a speed of six strokes per minute, are: Width between housings, 12 feet 4 inches; height above floor line, 16 feet; depth below floor line, 40 inches; floor space, 8 feet 4 inches by 23 feet 4 inches; gear ratio, 45 to 1; total weight, about 165,000 pounds.



FOSDICK HORIZONTAL BORING AND DRILLING MACHINE.

A NEW HORIZONTAL BORING AND DRILLING MACHINE.

The machine illustrated herewith is the latest design brought out by the Fosdick Machine Tool Co., Cincinnati, O., and is built in two sizes known as Nos. 1 and 2. A column is provided with both hand and power movement in both directions on the bed, together with a rapid traverse motion operated by a lever located at the front of machine. The saddle is counterbalanced and provided with both hand and power movement, together with rapid traverse by hand. The spindle sleeve bearings are of bronze, and the spindle nose is threaded to carry chucks, milling cutters and facing heads. The spindle bar is driven by two keys, and is fitted with Nos. 5 or 6 Morse tapers; it is also provided with cotter key for driving boring bars, and with hand and power feed. The back gears are of the tumbler type and can be engaged while the machine is running by means of a lever located convenient to the operator. The outboard column has both horizontal and vertical movement by hand and, as well as the main column, is provided with scales for quick adjustment of bearing. There are eight changes of feed, ranging from 0.007 inch to 0.25 inch per revolution, and 16 changes of spindle speeds, ranging from 4 to 260 per minute, which are secured either by cone pulley or speed box by using a double speed countershaft.

The motor drives, when provided, are arranged either with a 7½-horsepower constant speed motor connecting through gearing to the speed box, or a variable speed motor mounted on the rear of the machine and connecting through gearing direct to the driving shaft. Some of the particulars of the No. 2 machine, the larger of the two sizes, are as follows: Diameter of spindle bar, 4 inches; traverse of spindle, 30 inches; vertical adjustment of saddle on column, 54 inches; horizontal movement of column on bed, 62 inches; size of table, 42 x 120 inches; approximate weight, 16,000 pounds.

NEW PUBLICATIONS.

GRAPHITE AS A LUBRICANT.—Eleventh Edition; A Treatise Upon the Theory and Practice of Graphite Lubrication; published and distributed gratis by Joseph Dixon Crucible Co., Jersey City, N. J.

CADMIUM IN 1908.— By C. E. Siebenthal; advance chapter from mineral resources of the United States calendar year 1908; Washington, D. C., U. S. Geological Survey.

THE PRODUCTION OF QUICKSILVER IN 1908.—By H. D. McCaskey; advance chapter from mineral resources of the United States calendar year 1908; Washington, U. S. Geological Survey.

CUTTING AND WELDING OF METALS BY MEANS OF OXYGEN AND HYROGEN.—Booklet published and distributed by The American Oxhydric Co., Milwaukee, Wis.

THE CUT-METER.—Booklet distributed by the Warner Instrument Co., Beloit, Wis.

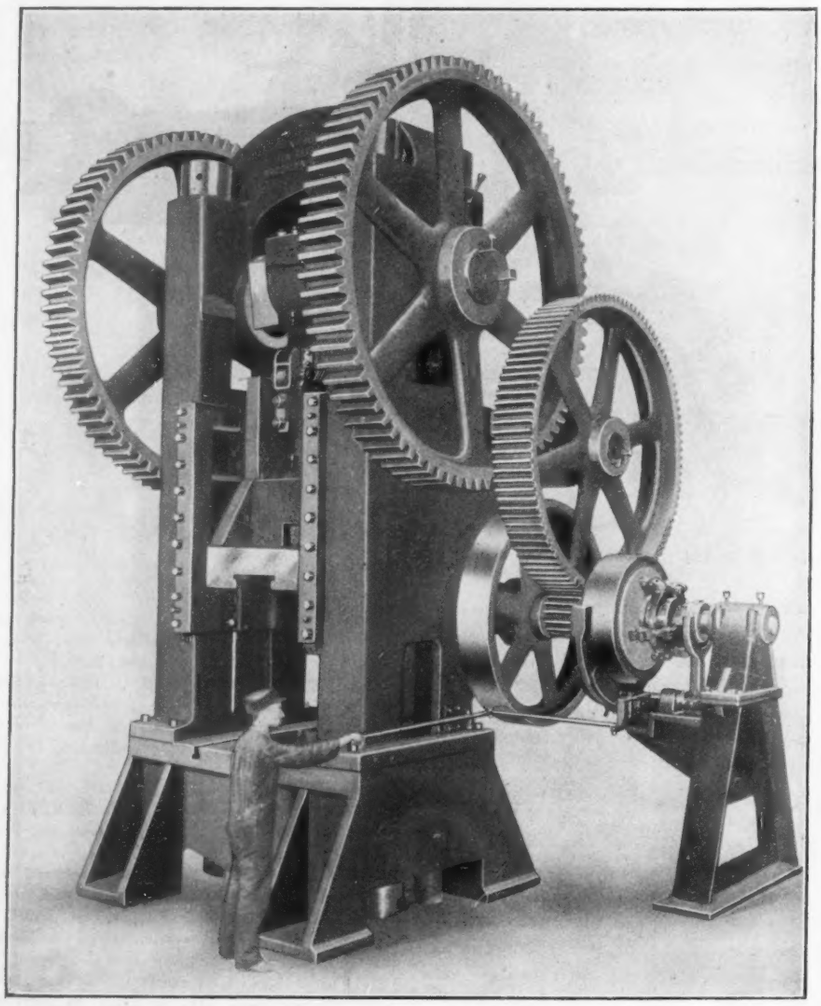
"SALES TALKS ON THE DODGE LINE."—Issued serially by the Dodge Mfg. Co., Michawaka, Ind. This company has also issued a neat little booklet, illustrated, showing how the "Dodge Idea" can be made to increase profits.

A SINGLE CRANK PRESS OF UNUSUAL PROPORTIONS.

A straight sided, single crank, single action press shown in the accompanying illustration has recently been built for the Hydraulic Pressed Steel Co., of Cleveland, by the E. W. Bliss Co., New York, and is believed to be the largest machine of its type ever built.

The press is of the built-up type, with four large vertical steel tie rods which relieve the frame columns of the working strains due to the pressure exerted on the working stroke. The frame columns themselves, with their heavy spreading feet, are proportioned to secure ample stability. The crank shaft is solid forged and is 15 inches in diameter. The slide weighs over 7 tons, and each of the main gears over 6 tons. The gearing is of steel throughout, machine cut. The bed is 48 x 60 inches. The weight of the machine complete is 164,000 pounds. The double drive is employed in line with the best modern construction in heavy press work. The machine is controlled by an improved type of combined friction clutch and brake, and a safety coupling is fitted to fly wheel to prevent damage in case of excessive pressure from carelessness or other causes.

The crank press is rapidly displacing the hydraulic in lines where rapid production is essential, and it is claimed that an additional advantage lies in the greater facility with which the die and punch alignment may be preserved. The machine shown has been built for forming sheet metal of extra heavy gages, cold, for automobile and similar work.



Bliss Single Crank Press.

NEW CATALOGS.

MOTOR TRUCKS.—In a 16-page 9 x 12 inch catalog the Oscar Lear Automobile Co., Springfield, O., describes its Frayer-Miller blower-cooled automobile trucks for commercial purposes, covering a line of both heavy and light vehicles, including multiple seated sight-seeing cars.

STEAM REGENERATORS.—The exhaust steam regenerator designed by Prof. A. Rateau, is described in a 25-page 9 x 11-inch catalog issued by the Rateau Steam Regenerator Co., No. 2 Rector street, New York City, with a list of plants in operation or being erected which shows the use of the regenerator to be rapidly extending.

MAGNETIC SEPARATORS.—Bulletin No. 21 of the Dings Electro-Magnetic Separator Co., Milwaukee, Wis., 20 6 x 9-inch pages, describes the magnetic separators and their application to the separation and concentration of ores.

FIRE BOATS.—Bulletin No. 4702 of the General Electric Co. is devoted to a description of turbo pump fire boats, with examples of recent construction and records of tests.

TUNGSTEN LAMPS.—The General Electric Co. has recently issued two pamphlets, Nos. 3878 and 3874, which should be of special interest to owners of either electric or gasoline automobiles. The one illustrates and describes the method of charging electric automobiles from alternating current circuits by means of the General Electric rectifiers; the other shows the advantage of the use of the Tungsten lamp for automobile lights.

AIR COMPRESSORS.—A 4-page pamphlet issued by the Mesta Machine Co., Pittsburg, describes Corliss driven air compressors in various types and sizes.

STRUCTURAL SHOP TOOLS.—The Wiener Machinery Co., 50 Church St., New York City, is distributing an 8-page catalog descriptive of heavy duty shears and coping machines, both stationary and portable, with illustrations of their application to the various shapes employed in structural work.

COAL CUTTERS.—Bulletin No. 18, issued by the Jeffrey Mfg. Co., Columbus, O., 32 8 x 10-inch pages, describes its coal cutting machinery of both compressed air and electric types, with illustrations of both types of apparatus at work. The details of construction are plainly set forth. The bulletin also covers electric mine locomotives and rotary drills.

CONVEYING MACHINERY.—The Jeffrey Mfg. Co., has also issued a very comprehensive 368-page 6 x 9-inch catalog, covering its complete line of elevating, conveying and transmission machinery, sprocket chains and wheels in a great variety of styles, conveying and drag chains, pulley and gear lists, etc.

SPEEDOMETERS AND DYNAMOMETERS.—The Electric Speedometer & Dynamometer Mfg. Co., Washington, D. C., has issued a 30-page 8 x 12-inch catalog describing the "Dynatak" speedometer and dynamometer for gas and gasoline engines in stationary, automobile or power boat service, with the theory of construction and method of operation, and setting forth the advantages to be obtained from its employment. The catalog also gives complete instructions for attachment.

PUMPS AND CONDENSERS.—The Schutte & Koerting Co., Philadelphia, is issuing Section *N* for catalog No. 2 and Section R for catalog No. 4 describing Koerting water jet pumps and vapor condensers, respectively.

ELECTRIC APPARATUS.—The Emerson Electric Mfg. Co., St. Louis, has issued Bulletin No. 3137, describing single phase induction motors; No. 3308, describing electrically driven hot air furnace blowers, and No. 3309, covering electrical forge blowers.

BLOWERS.—Sectional catalog No. 250, superseding No. 190, has been issued by the American Blower Co., describing its line of "A B C" blowers for a variety of purposes, including both belt, steam and motor driven fans, with references to other lines of product, such as exhausters, engines, draft plants, dryer equipment, etc.

NEWS FROM MANY INDUSTRIES

(In order to assist the post offices in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers:—

The following manufacturing companies have been chartered:

The Racine Foundry Co., Racine, Wis.; $40.000; by H. E. Graham, B. P. Budsell and W. C. Palmer.

The McCathron Boiler Works Co., Bridgeport, Conn.; $5,000; Henry M. McCathron, Edward C. Spargo and Helen M. Keefer.

The Brown Wrench Co., Ronceverte, W. Va.; $50,000; by C. P. Brown, F. B. Albert, T. C. Frey and F. H. Levy, all of Ronceverte.

The Cohen-Schwartz Rail & Steel Co., St. Louis, Mo.; $150,000; by Herman Cohen, Max P. Cohen and Selig Schwartz; scrap iron, junk, etc.

The Frank Davies Machinery Co., New Orleans, La.; $100,000; by E. H. Wharton, president; L. R. Hoover, vice president, and Douglas W. Davies, secretary and treasurer.

The Maxwell-Knight Iron Co., Mountain City, Tenn.; $100,000; by R. E. Donnelly, H. A. Donnelly, E. E. Butler, D. H. Donnelly and W. T. Smith.

The Buffalo Tool & Supply Co., Buffalo; machinery, tools, etc., $5,000; by Augustus B. Kellogg, Charles S. Park, both of Marine Bank building, Buffalo, and Myron Grennell, Waymart, Pa.

The Greenpoint Pipe & Metal Co., No. 6 Bedford Avenue, Brooklyn, N. Y.; metal pipe and tubing; $10,000; by William Rylance, St. Albans, N. Y.; Mary C. Connor, 797 St. Johns Place; John H. Farrington, 92 Johnson street, both of Brooklyn.

The S. K. F. Ball Bearing Co., Manhattan, N. Y.; mechanical and electrical engineer, machinist, tool maker, etc.; $50,000; by Samuel T. Hubbard, Yonkers, N. Y.; Frederick H. Poor, Morristown, N. J.; Axel Carlander, Gothenburg, Sweden.

The Economy Woodworking Machinery Co., New York City; foundry and machine shop; $50,000; by Bernard Rosenberg, 101 West Eighty-fourth, New York City; Frederick P. Hall, 150 Henry street, Brooklyn, Eugene I. Gottlieb, 1065 Boston, the Bronx.

The Autoparts Mfg. Co., New York City; machinery, automobiles, parts, etc.; $100,000; by William A. August, Jersey City, N. J.; Austin J. Wetmore, 109 W. Forty-eighth street, New York City; Albert Schaible, 221 Bainbridge street, Brooklyn, N. Y.

New Construction:—

The Modern Foundry Co., Oakley, O., near Cincinnati, is receiving estimates for an addition 30 x 90 feet, of mill construction.

Property in Racine, Wis., has been secured upon which the Graham Mfg. Co. of that city, contemplates the erection of an aluminum foundry.

The Sharon Steel Hoop Co. is rapidly completing the new open-hearth capacity at its plant at Sharon, Pa., and expects it to make the initial heat about the middle of January.

The Empire Grate Co. of Chester, Pa., is remodeling the old Daugherty & Feeley boiler shops which it recently purchased, and it expects soon to occupy the new quarters.

The Buckeye Traction Ditcher Co., Findlay, O., which recently increased its capital stock from $100,000 to $300,000, plans to build a large factory building.

The Standard Steel Works has begun the construction of a steel and concrete building, 70 x 185 feet, as an addition to its wheel foundry at Lewiston, Pa.

The General Foundry, Pontiac, Mich., advises respecting some new construction recently noted, that its building will be 50 x 80 feet. It is also installing modern equipment.

The Windsor Machine Co., Windsor, Vt., note of whose new construction was recently made, advises that it is putting up a shop 132 x 580 feet, one story, saw tooth roof construction.

A four story and basement reinforced concrete building is to be built on the corner of Orleans and Ohio streets, Chicago, for the use of the Bryant Zinc Co. The company manufactures batter zinc.

The Erie railroad has announced that it will expend $150,000 to remodel its shops at Kent, O., transferring the forging department of the whole system there, as well as enlarging the yards.

C. P. Kimball & Co., Chicago, have purchased a site on Michigan avenue and Thirty-ninth street, upon which they propose to construct a building for their automobile manufacturing business at an estimated cost of $500,000.

The Crown Cork & Seal Co., Baltimore, has had plans prepared for a brass foundry to be added to its plant at Guilford avenue and Oliver street. The foundry will be fireproof, 40 x 70 feet, estimated to cost $10,000.

Rapid progress is being made in constructing the proposed erecting and boiler shops for the Baldwin Locomotive Works, near Chester, Pa. A large part of the structural steel is up, and the sides and roof will be started in a short time.

The American Sanitary Mfg. Co., of Detroit, operating a general brass foundry, has signed an agreement with the Business Men's Club of Abingdon, Ill., to remove its plant to that city. It will begin the erection of a three-story brick building, 50 x 120 feet, and expects to be operating within a few months.

The Milwaukee Stove Works, Milwaukee, advises respecting the fire of Dec. 8, that its foundry was totally destroyed by fire, together with part of the warehouse. The loss aggregated $20,000, fully covered by insurance. It further advises that it will occupy the foundry buildings on the same premises, and but little additional equipment will be required to insure operating within 30 days.

The Riley-Klotz Mfg. Co., Newark, N. J., advises respecting its new construction, following its recent fire, that it has made all arrangements for rebuilding. There will be no new building, as all that is required is the re-construction of the interior of the buildings standing. Its power plant was not destroyed, and it is not in the market for anything new in the nature of power or machinery at this time.

Moore Bros. Foundry & Machine Co., Riverton, N. J., gray iron castings, advises that the New Jersey incorporation recently noted was made for the purpose of taking over the business now conducted by L. H. Moore Sr. and L. H. Moore Jr., under the firm name of Moore Bros., at Riverside, N. J., and with the ultimate idea of increasing the facilities of the company for turning out castings at lessened expenses. The property purchased at West Palmyra station is within 150 feet of the station. A new building 31 x 100 feet is being erected, containing a traveling crane from one end of the building to the other, and complete compressed air equipment, including the elevator to

the charging floor. The engine and cupola rooms are separate and adjoin the foundry building proper. After the completion of this building, it is planned to erect on the north side of the foundry a machine shop as well as a pattern shop. The officers of the company are: President, Alfred Smith; vice president, L. H. Moore. Sr.; secretary and treasurer, Alfred W. Smith.

General Industrial:—

The Illinois Bridge Co., Jacksonville, Ill., has certified to an increase in capital from $100,000 to $200,000.

The American Boiler Appliance Co., Aurora, Ill., has certified to the state authorities articles of dissolution.

The MacIntyre Iron Co., of Albany, N. Y., has certified to an increase of its capital from $160,000 to $200,000.

The Dennis & Vogel Mfg. Co., Milwaukee, has filed an amendment changing its name to the Dennis Friction Clutch Co.

Creditors have filed an involuntary petition in bankruptcy against the Pioneer Structural & Ornamental Iron Works, Chicago.

The Atlantic Radiator Co., Huntingdon, Pa., whose incorporation was recently noted, advises that its plant has been built and the equipment purchased.

In the effort to reorganize the Temple Foundry & Machine Co., Temple, Tex., the Commercial Club of that city is endeavoring to secure subscriptions to provide a working capital of $75,000.

The Reliable Foundry & Machine Co., Fort Madison, Ia., has made an assignment for the benefit of its creditors, W. A. Sherfe being named as the assignee. The company has been in existence for about three years.

The Standard Foundry Co., of Hartford, Conn., has certified to an increase in capital stock from $10,000 to $50,000, through Edward J. McDonough, Charles J. Johnson and Joseph P. Tuttle, directors.

The Buda Foundry & Mfg. Co., Harvey, Ill., advises that its recent change in name to The Buda Co., is a mere matter of convenience. The change in name does not signify any change in the organization or its line of manufacture.

When the Beaumont Iron Works was offered for public sale in Beaumont, Tex., by Receiver A. B. Brock recently, no bid was offered and the property was not sold. The upset price was placed at $190,000. It is said that the court may be petitioned to have the upset limit removed and another sale tried. The property inventoried at $180,000 when the receiver took charge.

The Southern Iron & Metal Co., Beaumont, Tex., which was recently incorporated, advises that it will deal in scrap iron, metal and machinery, its offices and warehouse being located at Crockett street and Avenue A. E. Marks, of A. Marks & Son, New Orleans, is president, and A. Blieden secretary.

At the annual meeting of the stockholders of the Landis Machine Co., Waynesboro, Pa., the following directors were elected: J. J. Oller, Frank Barnett, J. Edward Beck, B. F. Welty, J. S. Lesher, H. L. Fisher, J. F. Shank, G. Benedict, and Mark H. Landis, the latter to succeed C. B. Hershey, who has removed from Waynesboro.

The Indianapolis Foundry Co., Indianapolis, has filed new articles of incorporation, its former corporate period having expired. No change is made in the capital stock, which is placed at $50,000, nor in the incorporators, who are Frank W. Lewis, Frank B. Whitlock, and Emma M. Lewis.

When the sheriff sold the plant of the Delaware & Lackawanna Steel Co., of Oxford, N. Y., recently, to satisfy a number of executors, he wound up its affairs. The few remaining pieces of property were purchased by R. M. Petty, of Washington. The plant had been practically abandoned for the past seven months.

The Cleveland Machine Co., recently incorporated by B. F. Burke and G. A. H. Shideler, of Marion, Ind., and G. E. Cleveland, of Muncie, Ind., D. O. Skillen and A. S. Goodin, of Yorktown, Ind., with a capital stock of $20,000, will build machinery for manufacturing glass ware. The cities of Marion, Muncie and Yorktown are said to be under consideration for the location of the shops.

The R. K. LeBlond Machine Tool Co., Cincinnati, O., advises respecting its recent fire that the loss on the blacksmith shop, which is a separate building, amounted to about $2,000. No additional building will be erected at this time other than repair of the former structure, and no equipment is required, as the machinery in the shop was not sufficiently damaged to require replacement.

As a result of the settlement of the estate of Arthur H. Raymond, two separate corporations will succeed the Royal Equipment Co., Bridgeport, Conn. The Royal Engine Co., one of the two corporations, will occupy the plant of the Royal Equipment Co., and will be devoted exclusively to the manufacture of gasoline engines. The other company will probably continue to use the old name and manufacture automobile accessories.

The Akron Rubber Mold & Machine Co., Akron, O., with a capital of $10,000, has been incorporated by Stanley W. Harris and Frank Hoback, of Akron, and William D. Morris, Youngstown, O. It has bought out the Federal Engineering & Machine Co., at 911 Sweitzer avenue, Akron, and will make a specialty of manufacturing tire molds. Mr. Harris was superintendent of the Taplin-Rice-Clerkin Co., and Mr. Morris is the mechanical engineer of the Republic Rubber Co., Youngstown, O.

The state of Ohio has purchased the foundry of Alexander Adamson, lying along the Ohio canal, at Akron, O., and will construct a freight dock at that point. Mr. Adamson will move into a new plant on Carroll street about the middle of February, where a foundry and machine shop has been constructed, covering 50,000 square feet of floor space. A blacksmith shop and power house, each 45 x 90 feet, will be added. All the buildings will be of brick construction, two-stories with modern equipment.

Trade Notes:—

The Fred M. Prescott Steam Pump Co., Milwaukee, Wis., has opened a district sales office in Salt Lake City, Utah, in charge of R. E. Burke. The office will take care of the mine pumping machinery business of the company in the western field.

Allison J. Thompson, secretary of the Excello Arc Lamp Co., of New York, recently established a branch office of the company in room 822 Citizens building, Cleveland, O. Mr. Thompson is engaged to lecture before the Pittsburg Foundrymen's Association on foundry lighting, Jan. 23.

The Boone Expansion Bolt Works has opened a city office and sales rooms at 107 Chamber street, New York City, in the heart of the hardware district, and announces that a complete line will be carried in stock. The works are located at Port Richmond, Staten Island, N. Y., and were established in 1884.

The Allis-Chalmers Co., Milwaukee, Wis., has moved its San Francisco offices from 29 East Mission street to the Byron Jackson building, Second and Natoma streets, in order to accommodate its increased selling force. The offices are in charge of R. B. Elder, who has been engaged in engineering on the Pacific coast for 14 years.

GENERAL LIBRARY, UNIV. OF MICH. DEC 30 1909

IN THIS ISSUE: The Influence of High Speed Steel on Recent Machine Tool Design

THE IRON TRADE REVIEW

A Weekly Journal Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades.

Volume XLV—No. 27. CLEVELAND, DECEMBER 30, 1909. Three Dollars a Year. Single Copies Ten Cents.

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Announcement

We have acquired the plant and business formerly known as the **DUTCHER STEEL CASTING CO.** and will operate same in the production of

OPEN HEARTH

Steel Castings

With the completion of our new 20-ton furnace we will have a melting capacity of 140 tons daily at the Dutcher works alone.

The small castings will be made at the Crucible Works, where we have the largest and most modern Crucible Plant in the country.

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Milwaukee, Wis.

General Offices: 674 Kinnickinnic Ave.

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Crucible Works: Chicago Ave.

Chicago Office: 1705 Fisher Building

Classified Index for Buyers Page 80.

Boiler, Ship and Structural Rivets

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Hold some Reliable Maker Responsible for the Quality of Rivets You Drive

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STANDARD SPECIFICATIONS

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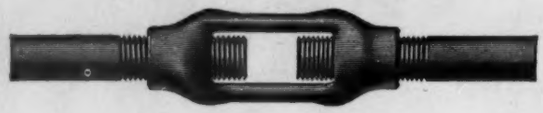
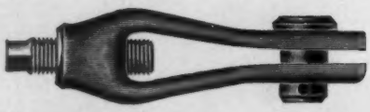
TURNBUCKLES



FORGINGS

OF ALL KINDS

Cleveland City Forge & Iron Company
CLEVELAND, OHIO



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Wherever our Portable Electrically Driven

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have done service they have proven their efficiency.

Our Tools are **AIR-COOLED** and do not get Hot.

DON'T FORGET THIS when considering Electric Tools.

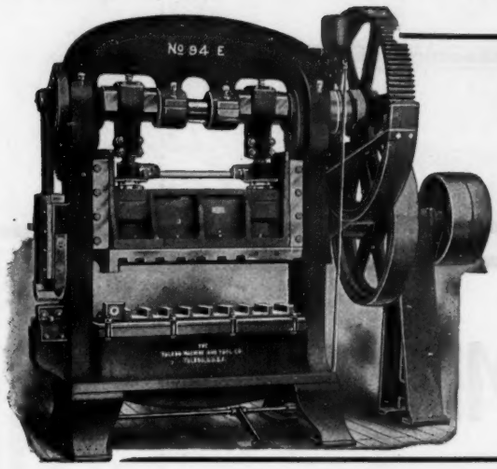
The Drills are made in 10 sizes: 3-16″, ¼″, ⅜″, ½″, ¾″, ⅞″, 1″, 1¼″, 2″, 2¼″.

The Grinders are made from ¼ to 2 H. P.

Let us send one on trial. Send for catalogue.

The Cincinnati Electrical Tool Co.

CINCINNATI, OHIO, U. S. A.



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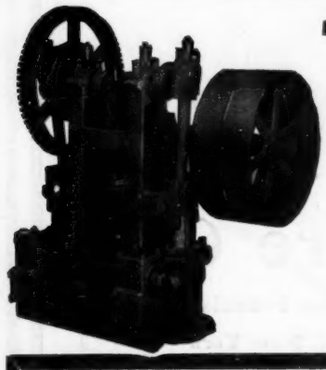

How to Reduce the Steam Expense
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At a test made in St. Louis, during the St. Louis Fair, a compound steam boiler feed pump (a much more economical pump than the ordinary Duplex steam boiler feed pump), 7 and 12 x 8 x 12 inches in size, showed a steam consumption of over 300 pounds of steam per horse power per hour. Compare this with the ordinary engine consumption of from 18 to 25 pounds per horse power per hour and consider the waste.

Now this great waste of steam and coal can be saved, not only a great portion of it, but often every pound of it, simply by using a power pump, belt driven, from the shop line shaft, or where electricity is available, by direct connection to a motor.

In plants of any size the saving will pay for the cost of installation easily, in less than a year. If you want to save money on your boiler feeding, write us, stating conditions and we will give you our advice. Ask for Catalogue "G" and treatise "Feeding Boilers."

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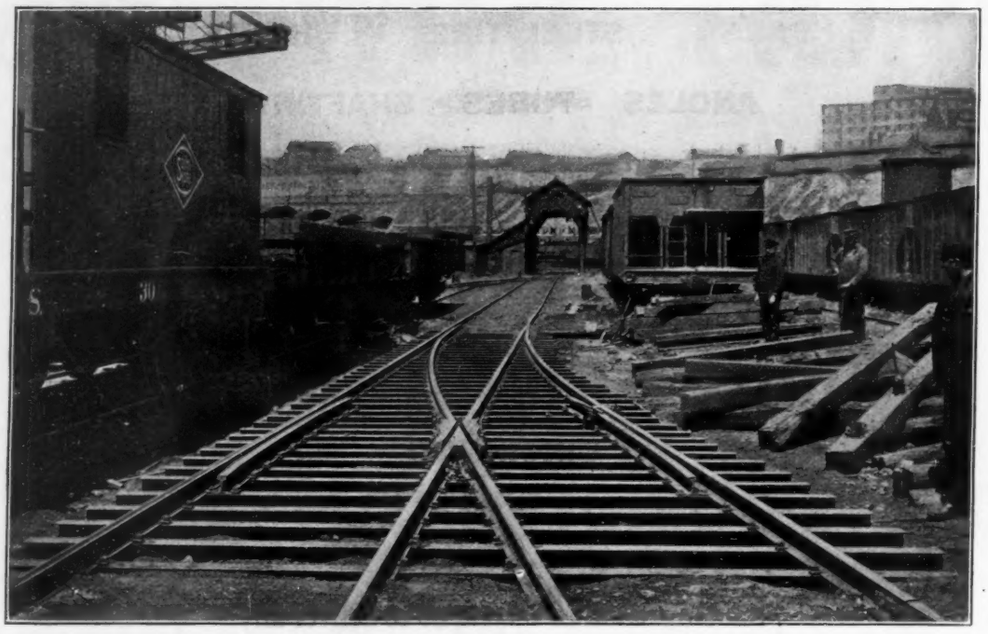

While the first cost of a steel cross-tie may be greater than a wood tie, the saving in maintenance during its long life and the scrap value when it is removed make it most economical.

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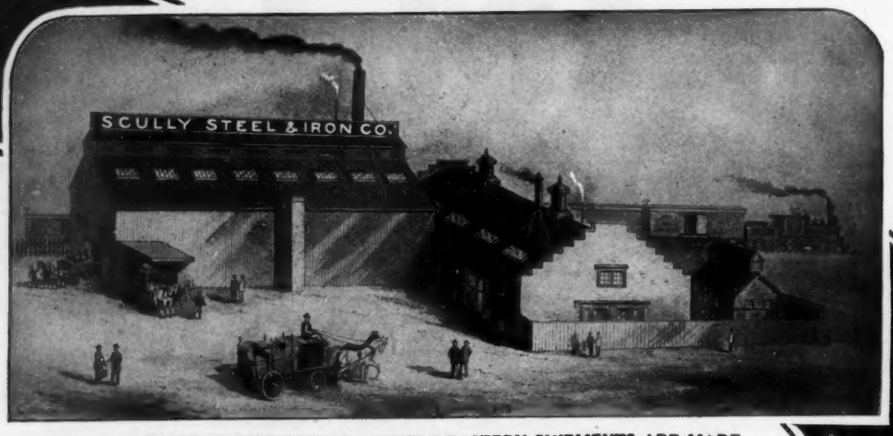

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Testimony From

"I started in on the steel tube, I think, in 1896. We made a three year test of them. Regarding pitting, my experience does not go so far, but as far as our water is concerned, it is very hard lime water. The pitting only takes place in places that have real pure water. As far as service is concerned, just as Mr. —— —— had in his report, the end that is in the sheet, when the flues are removed, is heavier at the present time than the iron flue would have been in three months' service, and the flues at the present time are not removed on account of the flues being worn out, but simply to get the mud and scale out of the boiler."

National Tube

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the Actual Users (★8)

¶ From time to time we have published statements regarding the merits of the "MODERN BOILER TUBE," i. e. the steel tube.

¶ In the last analysis, the success of any article must depend upon its own specific merits as evidenced by the experience of actual users.

¶ At the 1909 Convention of the International Master Boiler Makers' Association, held in Louisville, Ky., there was a discussion of the report of the Committee on Boiler Flues, and we quote from the published proceedings the remarks of the representative of a large railroad: (See opposite page)

¶ We call attention in the above to one point, viz.: this gentleman started the use of steel tubes a number of years ago (at a time when very few steel tubes were used). The boiler tube today, by reason of better knowledge of requirements to which it must be subjected, has been improved.

¶ We formerly made both the steel and iron boiler tube.

¶ Becoming convinced, however, by our experience and the experience of many others that the steel tube was the MODERN BOILER TUBE, we discontinued the manufacture of iron tubes, and are now devoting our entire attention in the boiler tube line to the steel tube.

¶ We make two kinds of steel tubes:

(*a*) The SHELBY SEAMLESS STEEL boiler tube. These tubes are just what their name implies, i. e., seamless, being made from a pierced billet without seam or weld. This type of steel boiler tube has been adopted by the United States Navy, after the most rigid tests possible.

(*b*) SPELLERIZED STEEL boiler tubes. These tubes are made by a special process, with a view to withstand severe conditions of service.

¶ Many users have materially decreased their boiler tube expense by the use of the MODERN BOILER TUBE. Do you feel you can afford to ignore their experience?

¶ Our representatives will be glad to take up with you any questions relative to conditions of your service.

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SAN FRANCISCO
ST. LOUIS
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*This is the eighth in a series of announcements regarding the "Testimony from the Actual Users." Others have appeared in previous issues and will appear in later issues of THE IRON TRADE REVIEW.

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TURNBUCKLES, TIE RODS, CROSS ARM BRACES

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Frick Building Pittsburg, Pa.

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All manufacturers understand the importance of getting immediately supplies required to keep their machinery in motion, but they do not all understand the reduced costs, increased selling prices, and increased output obtained by getting STEEL used in their product when needed.

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Our weekly Stock Sheet, which you receive or can receive if it interests you, lists our immense stock. Look at it when you need SHAPES, PLATES, FLATS, ROUNDS, SQUARES, RIVET RODS, RIVETS, RAILS, etc., and figure out how much you will gain in time and money by sending us your orders for immediate delivery.

PLAIN and TWISTED BARS delivered immediately, FOR REINFORCING CONCRETE, are an important part of our trade.

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ASK FOR OUR
OLD FASHIONED WROUGHT IRON SHEETS
TIME TRIED, AND FOUND NOT WANTING

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NILES, OHIO

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Universal Plates Flat Bar Steel Grooved Plates

Basic Pig Iron, Basic Open Hearth Steel Slabs,
Sheet Bars, Pipe, Skelp, Cut Nails.

Manufacturing from the Ore to the Finished Product insures greater uniformity of quality.

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Established in 1852

Steubenville, Ohio

The Highland Iron & Steel Co.

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BAR IRON

Full Range of Sizes
Large Flats a Specialty
8-9-10-12 Inches Wide

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Annealed Wire **Bright Wire** **Galvanized Wire**
Barbed Wire (on Regular, Pony or 80 Rod Spools)
Galvanized Twisted Cable Fence Wire
Hard Spring Coil Wire
Wire Fence Staples
Poultry Netting Staples
Standard Steel Wire Nails
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STEEL HOOPS **STEEL BANDS** **COTTON TIES**

AND

"PITTSBURGH PERFECT" Electrically Welded WIRE FENCING

COLONIAL STEEL COMPANY

PITTSBURGH, PA.

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We have ample capacity to handle promptly any specifications required in the trade.

Our tool steels in all grades are carried in large stocks in Pittsburgh, Philadelphia, New York, Boston and Chicago.

Crucible and Special Open Hearth STEEL

Every grade of special steel from high speed to special analysis openhearth, of uniform and regular quality. We are especially interested in alloy steels, such as Nickel Steel in any quantity.

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IRON AND STEEL BARS
AND SHAPES

Also Reinforcing Concrete Bars

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ROOFINGS

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Niles, Ohio

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CHICAGO
Open Hearth Steel

Bars, Angles, Channels,
Beams, Universal Plates

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WIRE NAIL

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VULCAN

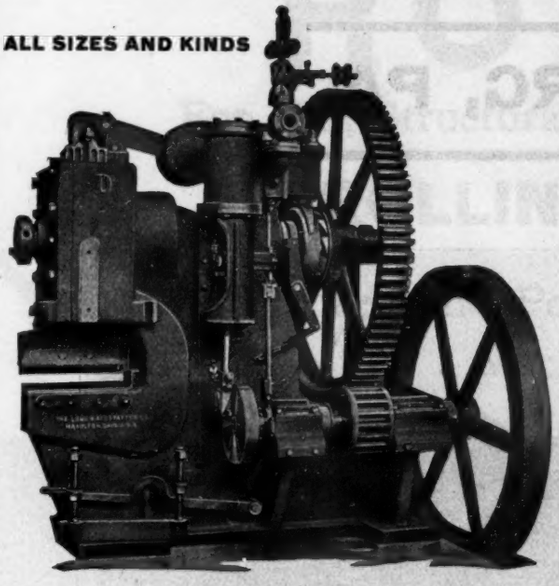
WE KEEP ALL SIZES AND SHAPES CONSTANTLY IN STOCK AND CAN FILL YOUR ORDERS PROMPTLY.

A WORD ABOUT IRON.

AN IMPORTANT QUESTION—Where can we get a GOOD IRON of such quality as we formerly used? is a question often asked in these days, when so many mills have turned their attention to steel, and so many others are making iron of very inferior quality. In answer to this question, we beg to call your attention to the fact that we devote ourselves specially to the manufacture of IRON OF SUPERIOR QUALITY AND FINISH, which we guarantee to give satisfaction. TRY OUR VULCAN IRON.

POWER PUNCHING AND SHEARING MACHINERY

ALL SIZES AND KINDS



Heavy Bar Iron Shear

Manufactured by

THE LONG & ALLSTATTER CO.
Hamilton, Ohio

Have You Received Our

NEW CATALOGUE

—OF—

Vertical and Horizontal Plate Bending

ROLLS

Punches Shears
Riveting Machines
Flanging Presses
Etc.?

A complete line of machinery for the Boiler Shop, Ship Yard, Structural Iron Shop, etc.

Write for it today.

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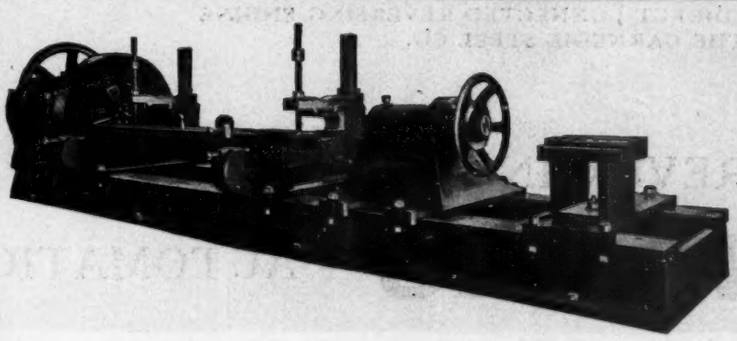
Pittsburg New York Saginaw, Mich.



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ROLLING MILL MACHINERY

Sand Chilled and Steel ROLLS

THE YOUNGSTOWN FOUNDRY & MACHINE CO., Youngstown, O.

MACKINTOSH, HEMPHILL & CO.

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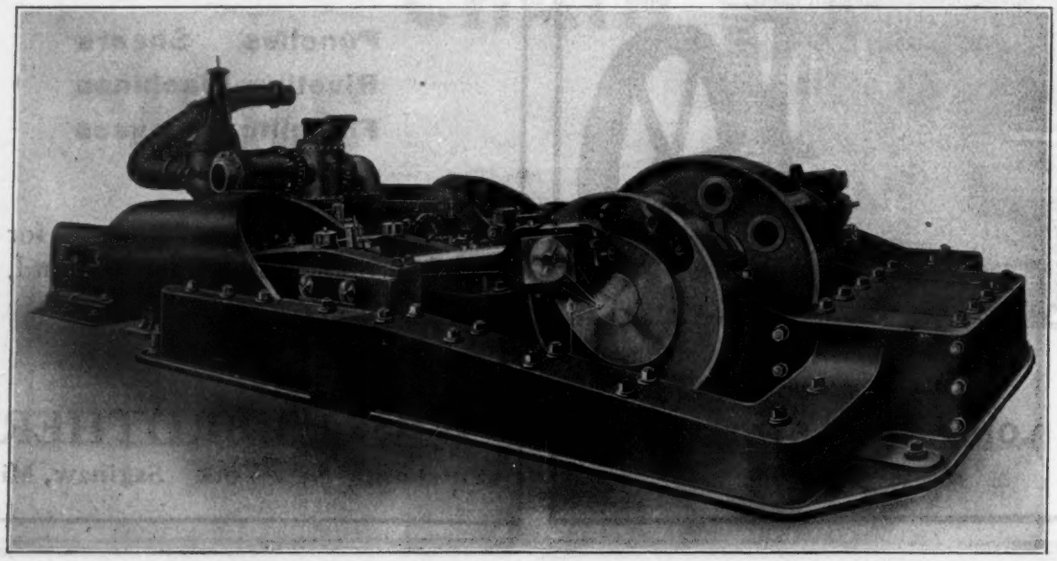

55 x 60 TWIN CYLINDER DIRECT CONNECTED REVERSING ENGINE
FOR THE CARNEGIE STEEL CO.

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CORLISS **ENGINES** AUTOMATIC

MESTA
MACHINE COMPANY
PITTSBURG, PA., U. S. A.

Chilled, Sand, Steel, Vanadium and Water Chilled

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For Bar, Structural, Blooming Slabbing

ROLLING MILLS

Engines and Power Transmission Machinery.

A View of the Mesta Roll Shop showing the variety of designs in Rolls.

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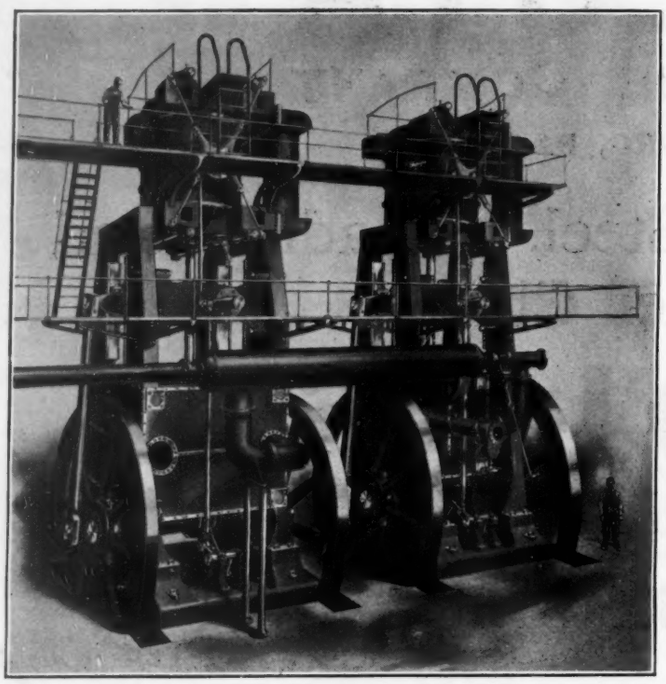

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IN STOCK FOR
IMMEDIATE SHIPMENT

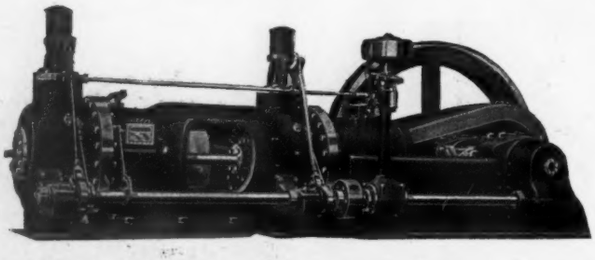
44" & 84" x 60"
84" & 84" x 60"
49" & 96" x 60"
96" & 96" x 60"

GAS ENGINES
MILL ENGINES
CORLISS ENGINES
PUMPING ENGINES
REVERSING ENGINES

The Badger Carries A Long Record

of things accomplished by Wisconsin Engines—Economy, Long Life, Adaptability, Highest Possible Steam Economy, High Rotative Speeds, etc., etc And the Badger marches at the head of the procession—Steam Turbines are down near the tail end as regards economy. A Wisconsin Engine outlasts a steam turbine many times It is the *most economical of steam prime movers* You don't believe that yet, but you will.

WISCONSIN ENGINE COMPANY Corliss, Wis.



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AND
SUCTION GAS PRODUCERS

Satisfactory and Continuous Service
Regulation and Economy Guaranteed

Working Parts
Few in Number
Easy of Access

ENGINES OF VERTICAL AND HORIZONTAL TYPES
75,000 Horse Power in Successful Operation

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Iron
Steel
Brass
Castings
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Daily Foundry CAPACITY: 300 Tons

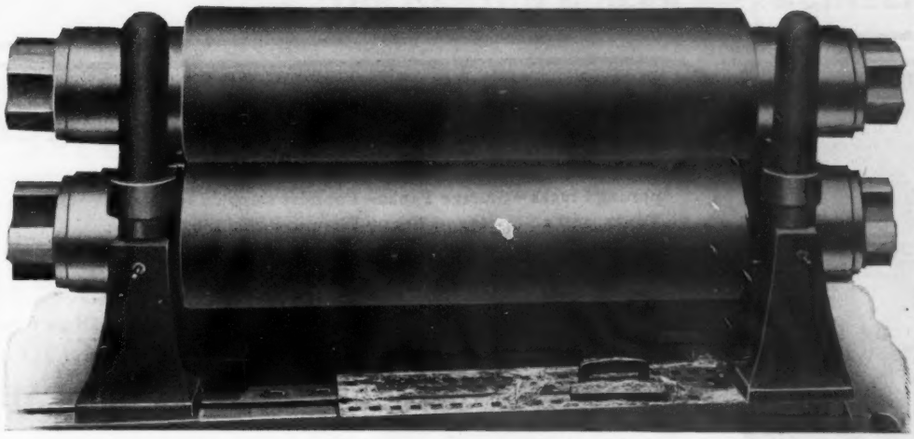
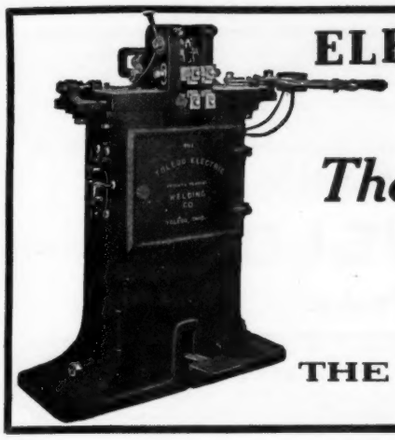


PLATE ROLLS

Slab
Bloom
Plate
Sheet
Tin
Mills
Induction
Reversing
Drives

PITTSBURGH OFFICE, Farmers Bank Bldg.

NEW YORK OFFICE, 120 Liberty St.



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For butt welding anything that's weldable,—
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Our new booklet tells about the different kinds,
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THE TOLEDO ELECTRIC WELDING CO.
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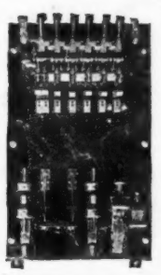

From the very beginning—nearly twenty years ago—The Cutler-Hammer Mfg. Co. has specialized along one line—the building of apparatus for

THE CONTROL OF ELECTRIC MOTORS

Today, counting standard constructions only and taking no account of the large number of special devices built to meet exceptional conditions, Cutler-Hammer apparatus comprises more than 2500 types and sizes of electric controlling devices. These standard constructions are all pictured and described in our general catalog, which is sent free on request to those who really have occasion to use it.

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BLAST FURNACE CONSTRUCTION

THE MEEHAN BOILER AND CONSTRUCTION CO.

LOWELLVILLE, OHIO.

Open hearth steel ladle, all capacities, from 35 to 70 tons

Steel Plate Construction

Open Hearth Ladles—Hot Metal Ladles and Cars—Steam Receivers—Self Supporting Stacks—Storage Tanks—Foundry Cupolas and Ladles—Oil Transportation Tanks, and all classes of Heavy Plate and Sheet Iron Work,

also

Internal fired, Tubular, Firebox and upright Boilers

High Grade Equipment—High Grade Mechanics—High Grade Work

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Dan'l Connelly, Pres.

Established 1875 CLEVELAND, OHIO Incorporated 1905

FARRAR & TREFTS

ESTABLISHED 1864

Tanks, Heating Shelves, Pans, Kettles, etc.

OXY-ACETYLENE WELDED

No rivets---No caulked joints---No leaks

BUFFALO, N.Y.

Special Specification Work
Pumping Engines
Blowing Engines
Gas Engines

RICHARD HAMMOND,
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Large Marine Boilers
to 16 feet in Diameter
Gen'l Contracting
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LAKE ERIE ENGINEERING WORKS

BUILD THE HIGHEST CLASS ENGINES OF ANY TYPE FOR SERVICE.

NO ENGINE, MACHINE, OR CASTING TOO HEAVY

Large Cast'gs and Machines to 50 Tons.—Turbine and Building Castings

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THE BEST EQUIPPED PLANT IN AMERICA FOR THE MANUFACTURE OF MODERN MARINE BOILERS

Stand Pipes
Pressure Pipe Line
Blast Furnace Work
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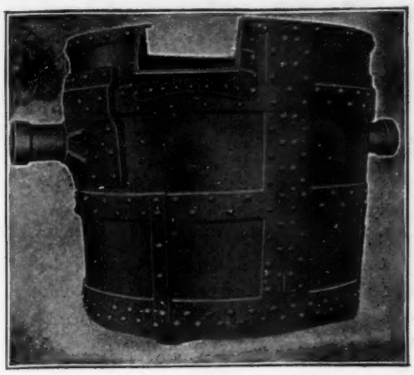

STEEL PLATE CONSTRUCTION

LADLES
ANNEALING BOXES
GALVANIZING POTS
STEEL PLANT AND
BLAST FURNACE
EQUIPMENT

OIL TANKS
WATER TANKS
ACID TANKS
FLUES
CHIMNEYS
STANDPIPES

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Canton, Ohio, U. S. A.

James G. Heggie

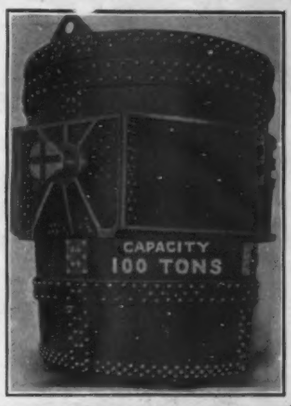
JOLIET, ILL.

Manufacturer of all classes of

Light and Heavy Plate Work

OPEN HEARTH AND HOT METAL LADLES
Gas Producers, Galvanizing Kettles,
Stacks, Riveted Pipe, Tanks, Boilers, Etc.

STEEL PLANT EQUIPMENT



THE PETROLEUM IRON WORKS CO.

Sharon, Pa.

Manufacture all classes of Steel Plate Construction, such as

Tanks, Stacks,
Blast Furnaces,
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THE COES
"Key Model" WRENCH

is the finest engine room tool ever made, anywhere, by anybody, at any time.

Made of heavy steel forgings, fully hardened by a special process, used by Mr. Coes for many years.

It will not batter or jam a large nut as will a chain wrench. It will not slip or make trouble and will take anything within its opening capacity, either square or hexagon.

Every Coes Wrench package bears this trade mark:

91

See that you get the genuine.

YOUR DEALER HAS THE "COES."

COES WRENCH CO.
WORCESTER, MASS.

American Iron and Steel Manufacturing Co.

General Office, Lebanon, Pennsylvania, U. S. A.

Rolling Mills and Factories located at Reading and Lebanon, Pennsylvania.

Manufacturers of

HOT PRESSED NUTS

(Also Machine Bolts, Track Bolts, Cold Punched Nuts, Rivets and Spikes. See General Catalogue.)

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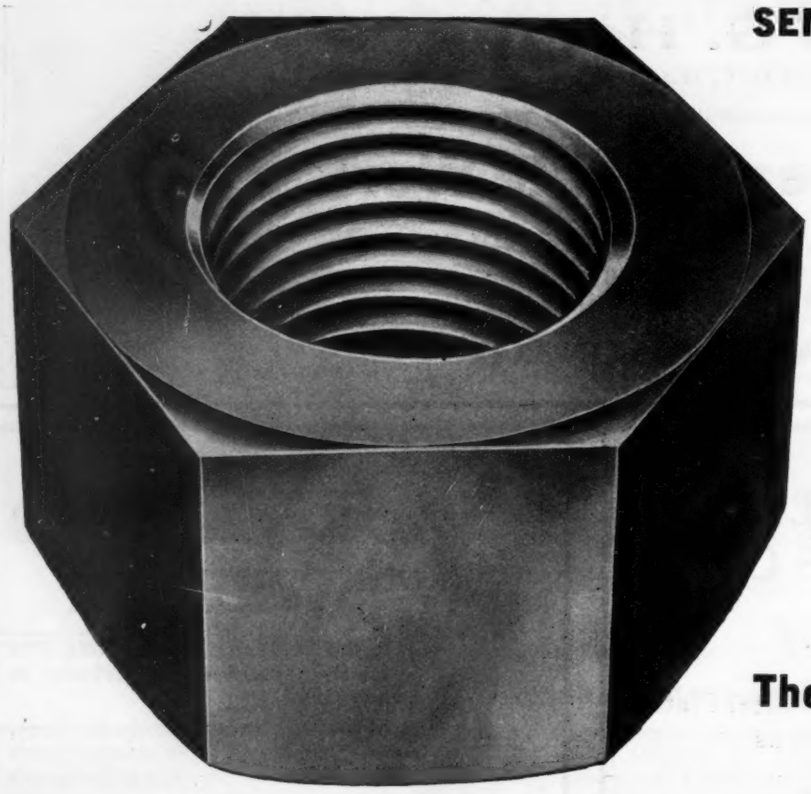

SEMI-FINISHED NUTS

"MILTON" STANDARD

Faced Perfectly

ALL SIZES BEST FINISH

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The Milton Mfg. Co.

Milton, Penn'a.

Bolts, Nuts, Rivets, Washers &c.

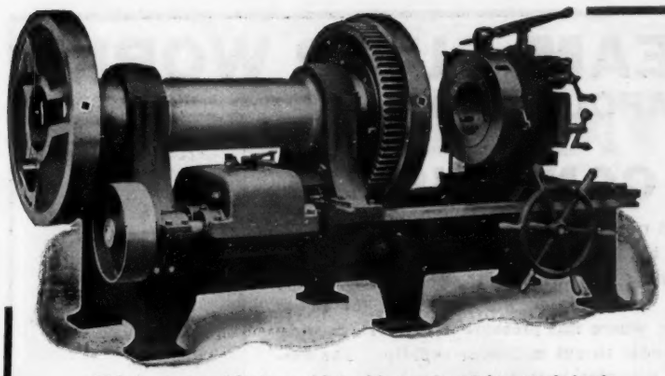
RUSSELL BURDSALL & WARD BOLT & NUT CO.

PORT CHESTER, NEW YORK

BRANCH AT ROCK FALLS, ILL.

WESTERN OFFICE, COMMERCIAL NAT'L BANK BLDG., CHICAGO, ILL.

CASE HARDENED, SEMI-FINISHED AND CASTELLATED NUTS A SPECIALTY



This is our new 8-inch machine with gear box drive, steel chuck slides, special anchored babbitted bearings.

Choose with Care

We emphasize strongly the importance of knowing the merits of B. & K. pipe machines. They prove in use the best money can buy, and a paying investment. There are over 140 B. & K. pipe machines operating in one city alone—Why? Ask anyone who knows the B. & K.

Get our catalog of power machines, and think it over.

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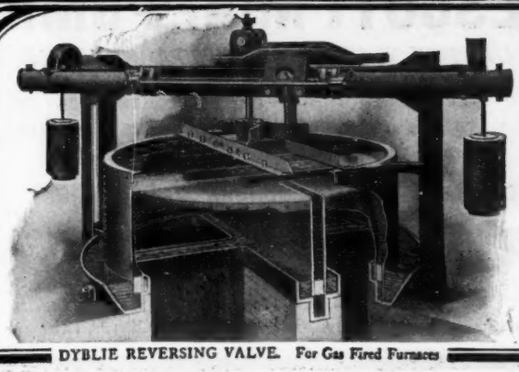
EDWARDSVILLE, ILL.

MORGAN CONSTRUCTION CO.

WORCESTER, MASS.
FOREIGN OFFICE, 51 RUE DU CONGRES, BRUSSELS, BELGIUM



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CONTINUOUS MILLS
For Billets, Merchant Bars, Light Structural Shapes, Hoops, Cotton Ties and Rods
CONTINUOUS HEATING FURNACES
CONTINUOUS GAS PRODUCERS
With George Automatic Feeds
AUXILIARY EQUIPMENT
As Roll Tables, Conveyors, Shears, Reels, Cooling Beds, Merchant Bar Storage Systems, Dyblie Reversing Valves
COMPLETE WIRE MILL EQUIPMENTS
GEAR PLANING, BEVEL SPUR, and SPIRAL GEARS

"Cincinnati" Shapers

Plain Crank Back Geared Crank
Geared Rack Traverse Open Side

72 Page Catalog Mailed on Request.

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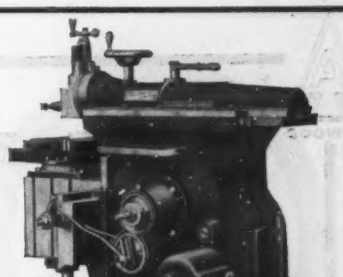

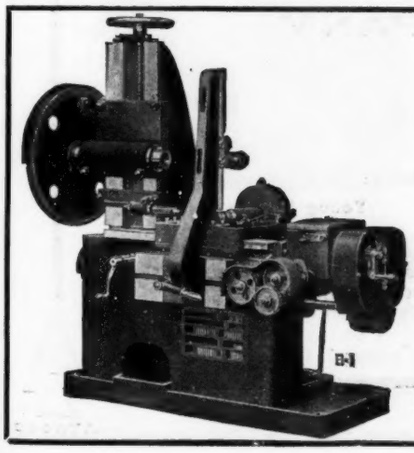

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Elam St. and Garrard Ave.

Cincinnati, Ohio.

Taper Gibs, endwise adjustable to all sliding surfaces, insure uniform wear and long life to the machine.

Manning Maxwell and Moore, Inc., New York, Boston, Chicago, Philadelphia, Pittsburgh, Cleveland, Milwaukee, Detroit, St. Louis, Syracuse, Atlanta, Buffalo and Mexico City, Agents.

DEAN BROS. STEAM PUMP WORKS
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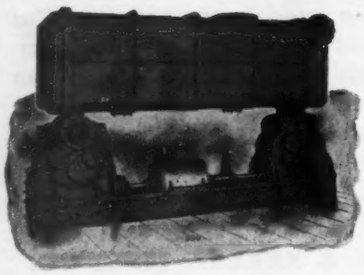
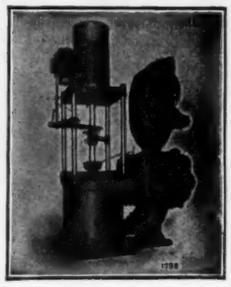


Surface Condenser

JET AND SURFACE CONDENSERS

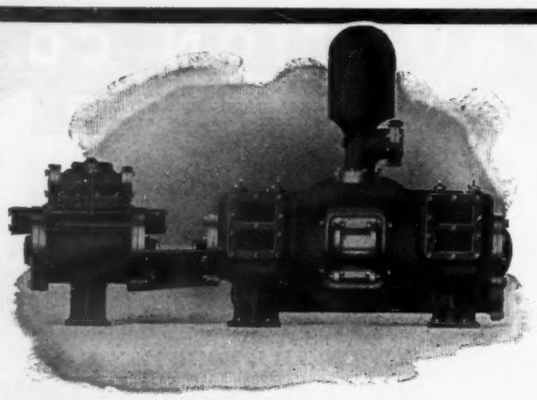
The vertical type of air pump is much more durable than the horizontal type. In horizontal pumps there is a constant downward wear of piston and rods. Any sediment in the water will settle on the lower side of cylinder where this pressure is greatest, causing piston and cylinder to cut and wear rapidly. The vertical air pump occupies but little floor space.

WRITE FOR CONDENSER CATALOGUE



Vertical Air Pump and Jet Condenser

PRESCOTT MINE PUMP
FOR GRITTY WATER AND HARD SERVICE



Outside packed plungers—deep bronze-lined renewable stuffing boxes with ready access to water valves by side plates.

Write for our Catalog 20-C on Mine Pumps.

FRED M. PRESCOTT STEAM PUMP COMPANY
Milwaukee, Wisconsin
District Sales Offices:
El Paso, Texas—Atlanta, Ga.—Salt Lake City, Utah. 61

ATWOOD

Valves and Fittings of All Sizes

ATWOOD

FOR ALL PURPOSES.

COMPLETE PIPING SYSTEMS OF ALL KINDS

PITTSBURGH VALVE, FOUNDRY & CONSTRUCTION COMPANY

PITTSBURGH, PA.

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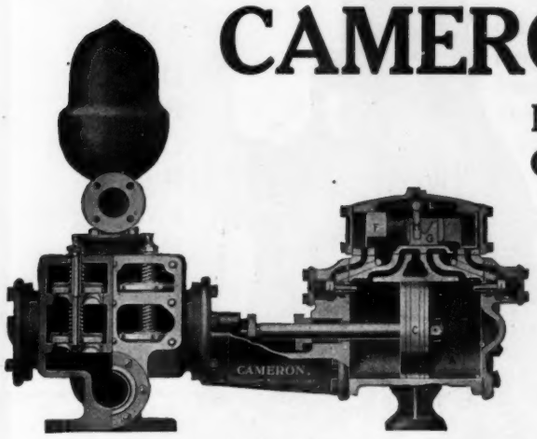
ATWOOD

ATWOOD

The Slogan of the Cameron—"Character: The Grandest Thing"

CAMERON PUMPS



NOTE THE SECTIONAL VIEW OF A REGULAR PATTERN

If you were to install a CAMERON PUMP, your pump repair bills would probably cease, but if at any time accident were to occur—which is possible, you will appreciate the ease with which repairs can be made or parts replaced in a CAMERON.

If sand or grit is drawn through the cylinder of an ordinary steam pump nine times in ten the usefulness of that pump is ended; not so with the CAMERON.

We build the cylinders of CAMERON PUMPS of hard close grained iron, heavy enough to permit reboring, if this is at any time found necessary.

Another strong point is the ease and readiness with which the internal mechanism of a CAMERON PUMP can be reached, which you will note by reference to the sectional illustration above.

See Cameron Catalog, Edition "D" for complete details.

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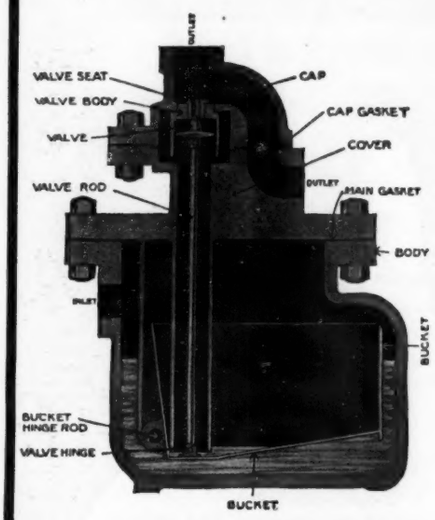

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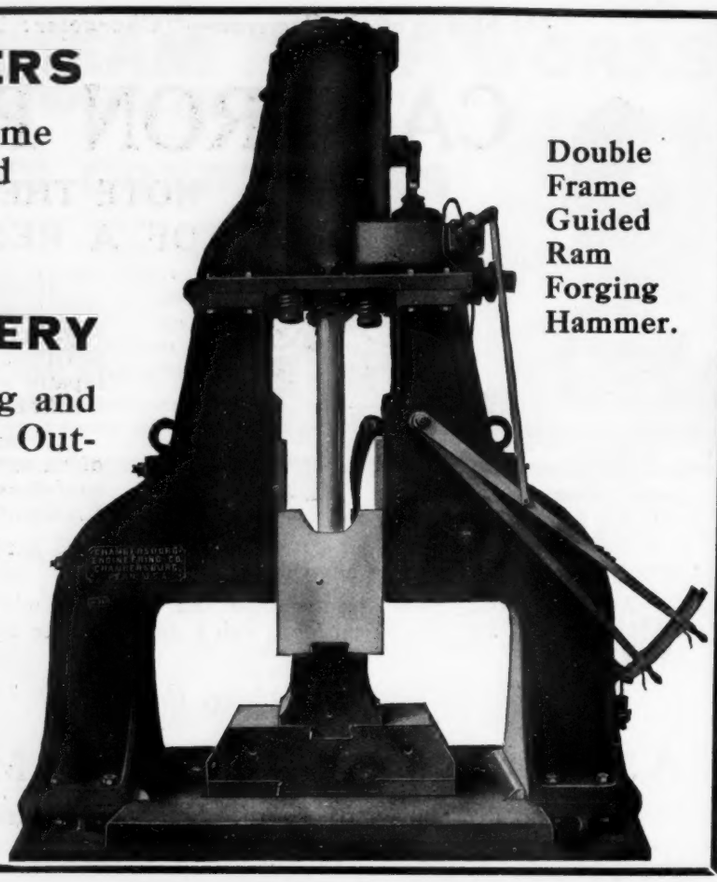

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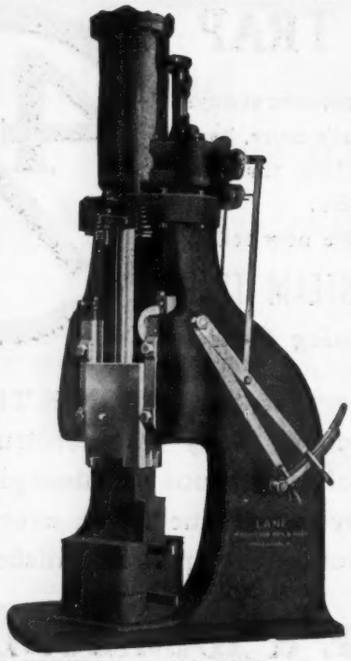

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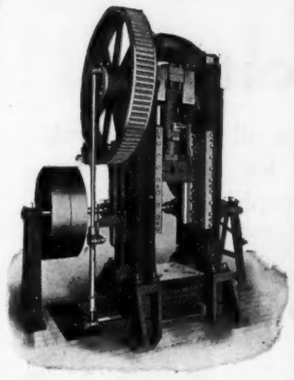

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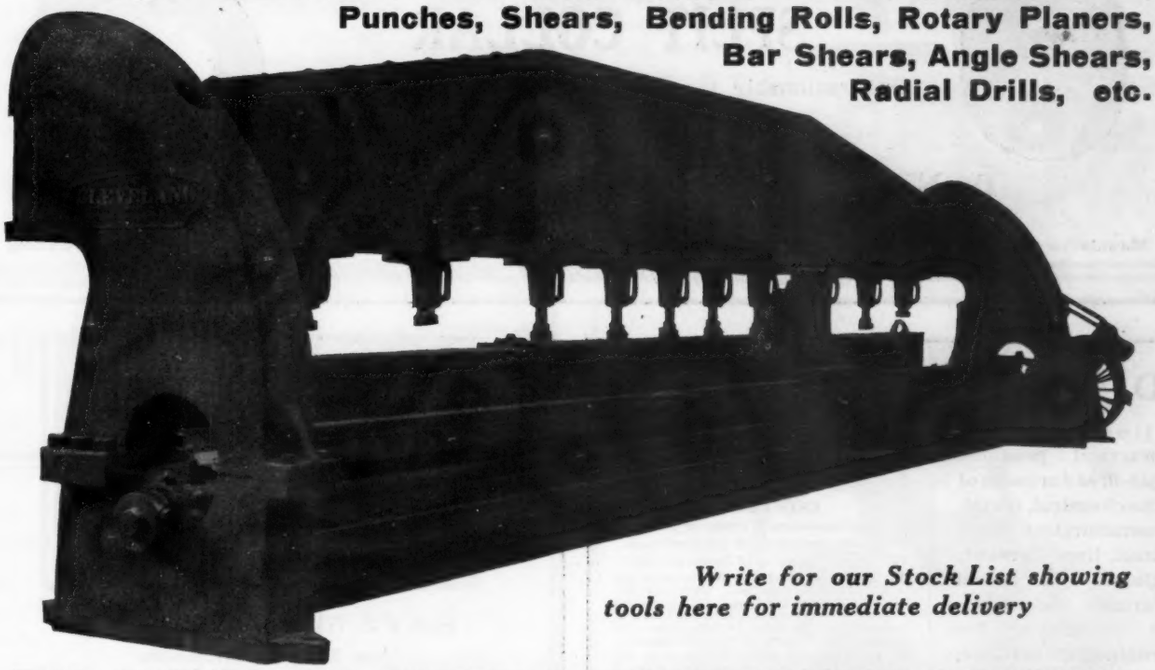

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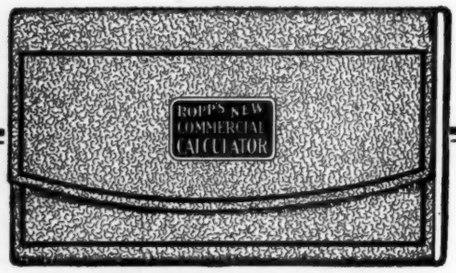

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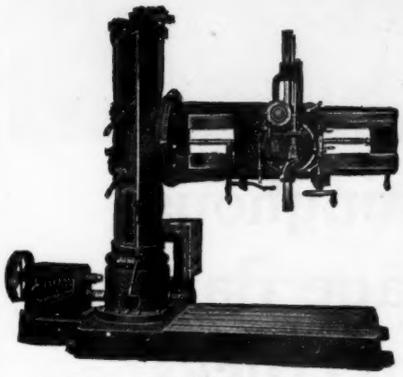

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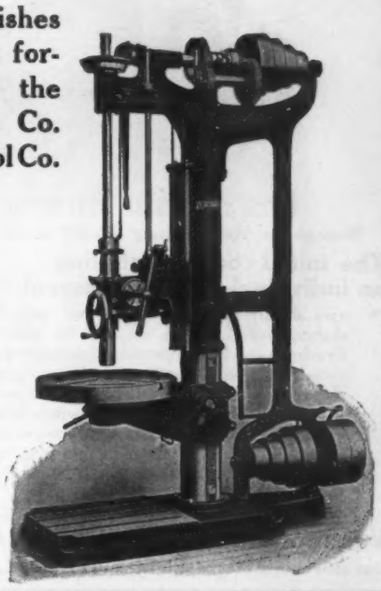

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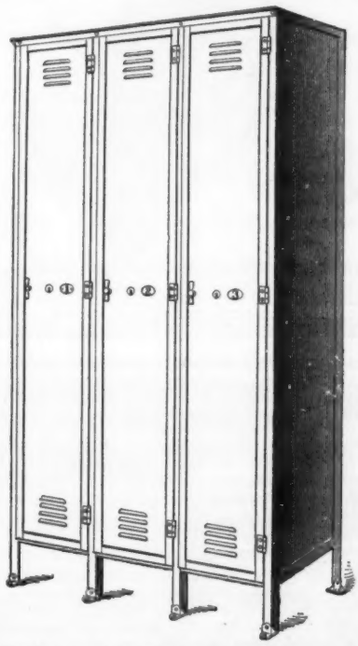

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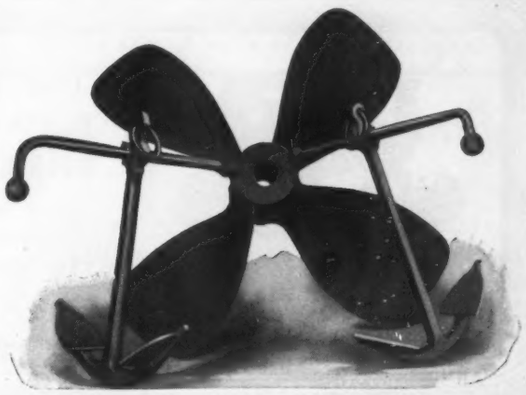

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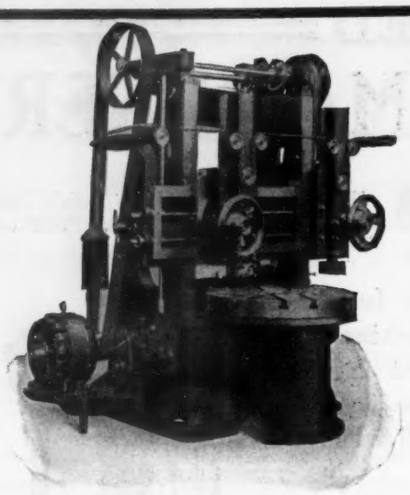

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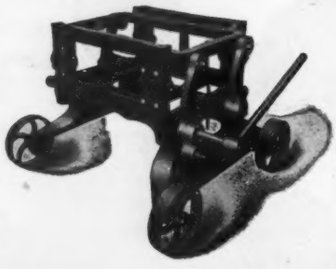

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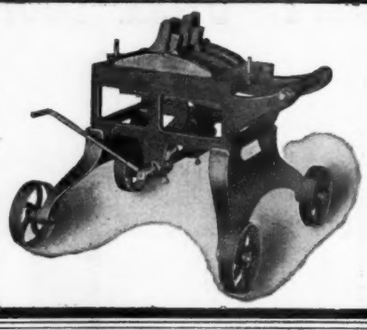

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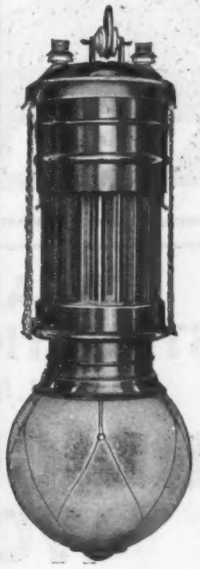

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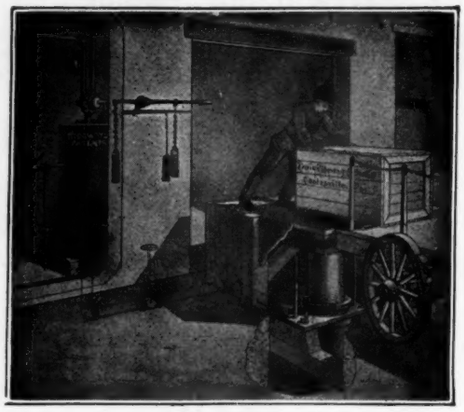

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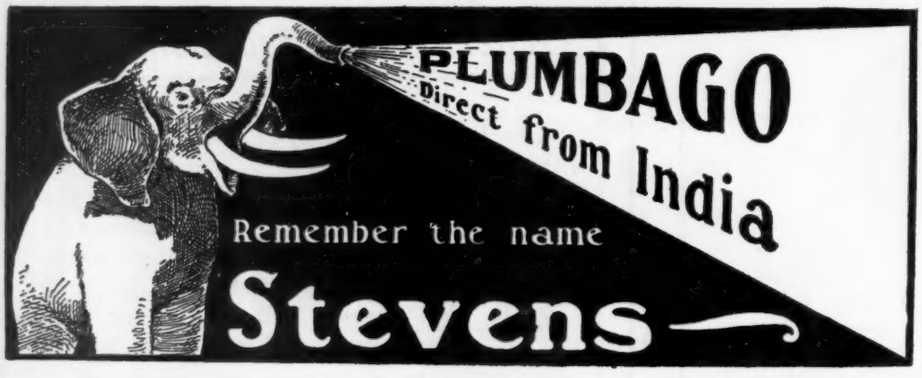

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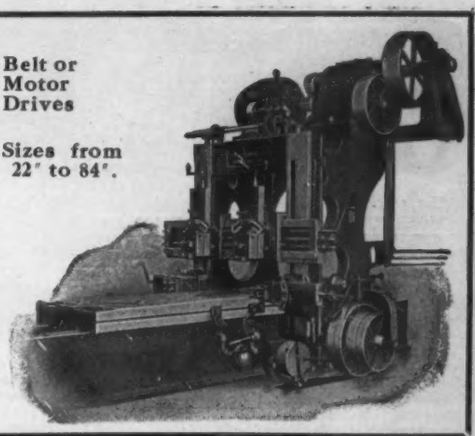

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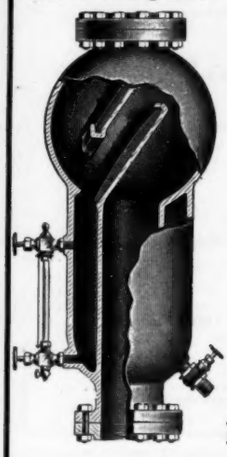

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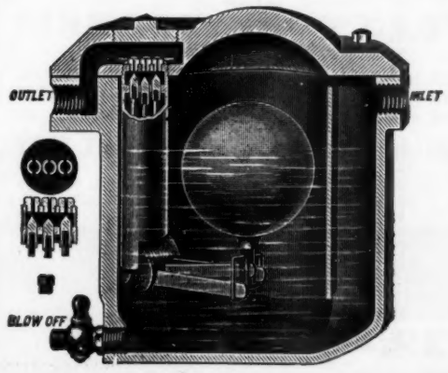

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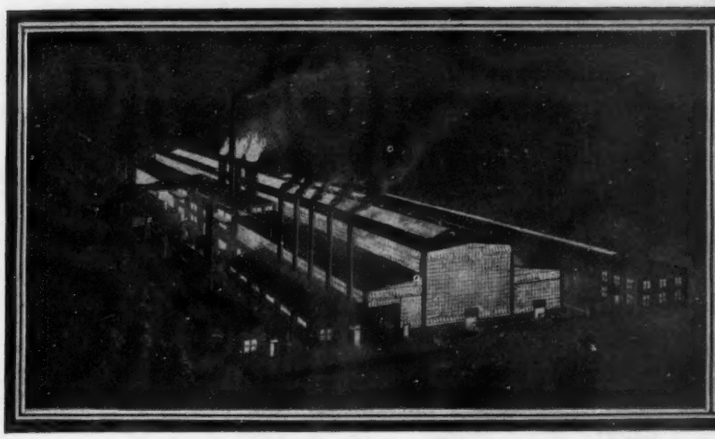

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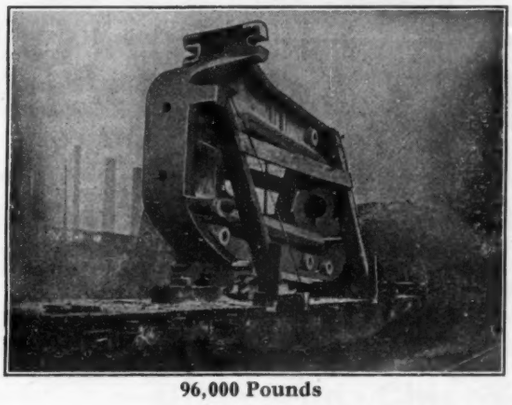

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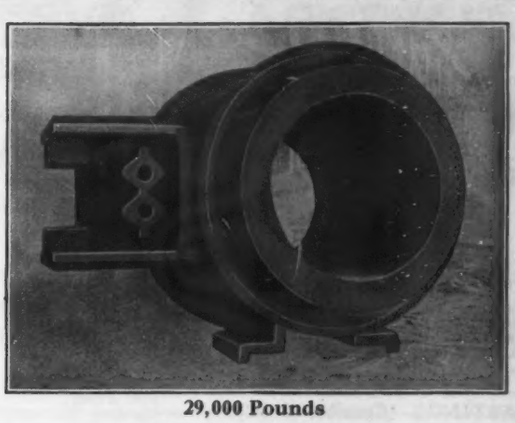

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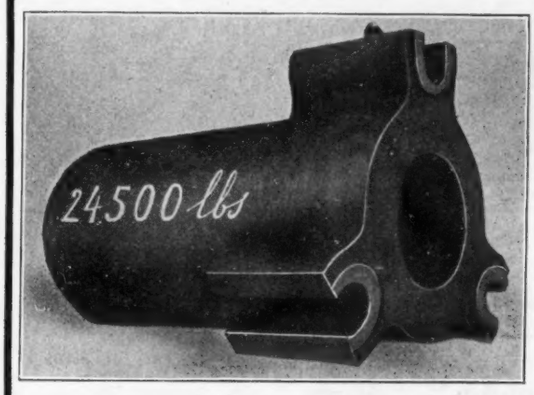

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Cleveland Crane & Engrg. Co., Wickliffe, O.
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Interstate Engineering Co., Bedford, O.
Manning, Maxwell & Moore, New York City.
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Mackintosh-Hemphill & Co., Pittsburg, Pa.
McMyler Mfg. Co., Cleveland, O.
Morgan Engineering Co., Alliance, O.
Niles-Bement-Pond Co., New York, N. Y.
Northern Engineering Works, Detroit, Mich.
Ridgway, Craig, & Son, Coatesville, Pa.
Shaw Electric Crane Co., New York, N. Y.
Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.
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Morgan Engineering Co., Alliance, O.
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Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.
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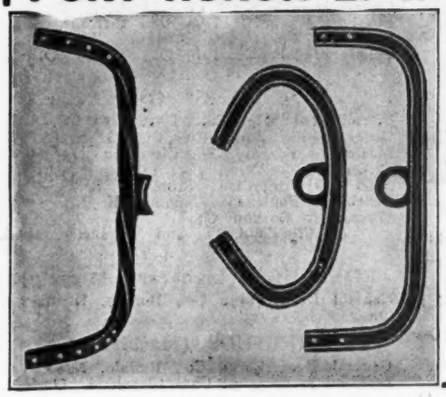

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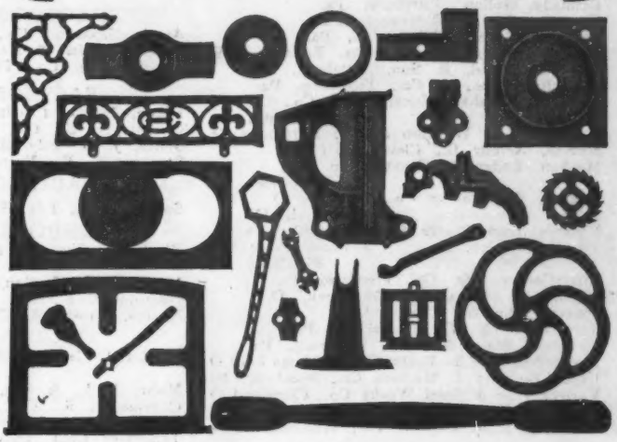

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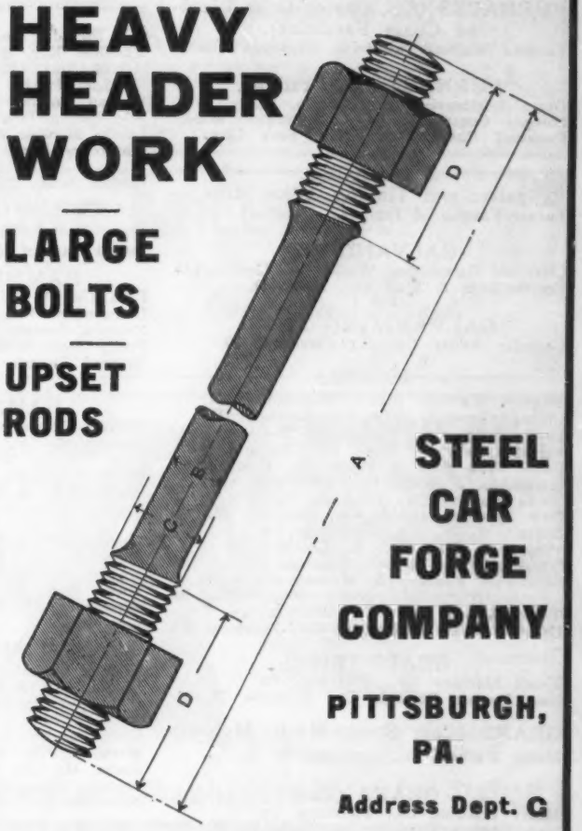

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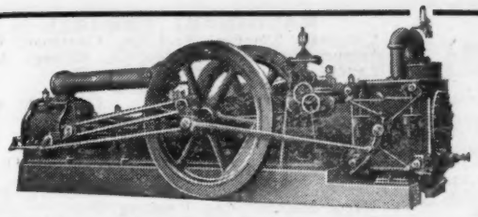

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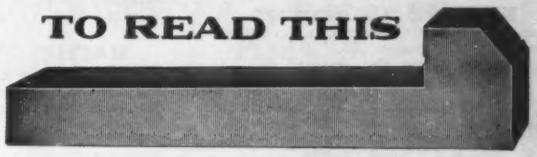

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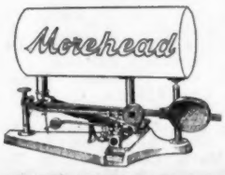

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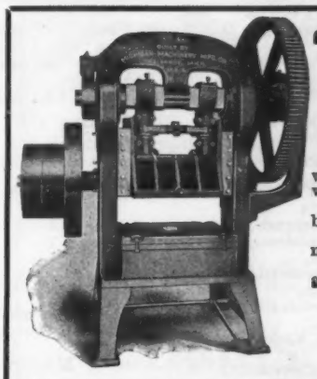

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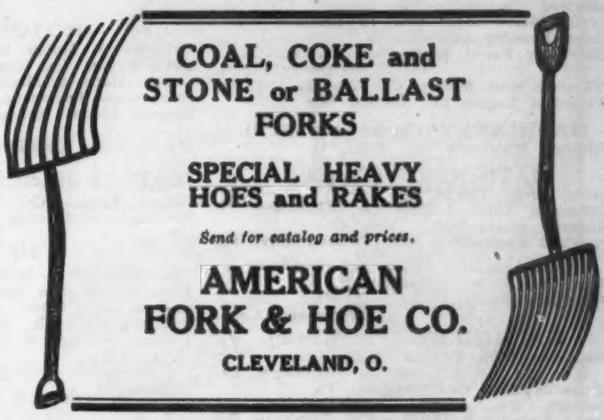

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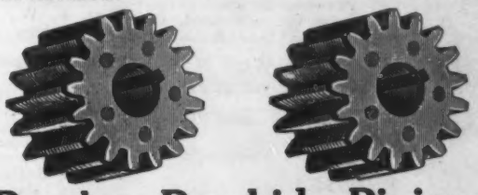

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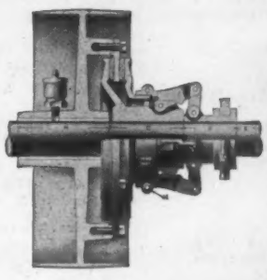

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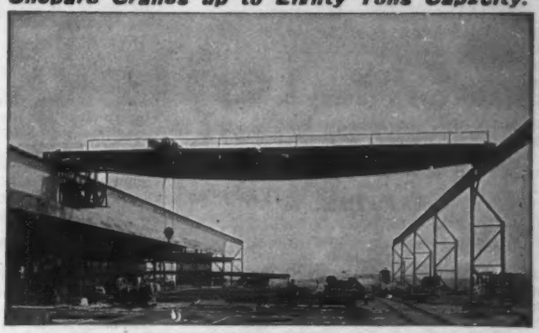


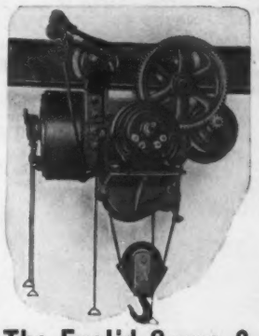
SHEPARD ELECTRIC CRANE & HOIST CO.
General Offices and Works, MONTOUR FALLS, N. Y.
NEW YORK PHILADELPHIA PITTSBURG CHICAGO

C. O. BARTLETT AND SNOW CO.
MAKERS OF CLEVELAND, O. U.S.A.

Conveyors, Elevators, Dryers,
Crushers, Screens, Feeders,
CAR HAULS, PAINT MACHINERY,
GYPSUM MACHINERY.

New York Office, No. 50 Church St.

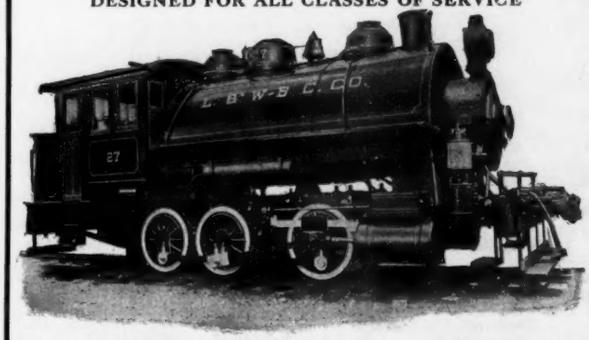
CRANES AND HOISTS



Electric and Hand Power Traveling Cranes, Jib and Post Cranes, Electric Hoists, floor and cab operated. Overhead Trolley Systems and Trolleys.

The Euclid Crane & Hoist Co. EUCLID, OHIO (Cleveland Suburb)

LOCOMOTIVES
DESIGNED FOR ALL CLASSES OF SERVICE



Vulcan Iron Works, Wilkes-Barre, Pa.

NEW YORK OFFICE: 42 BROADWAY

THE ALLIANCE MACHINE CO.
ALLIANCE OHIO

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ELECTRIC STRIPPING CRANES.
ELECTRIC LADLE CRANES.
ELECTRIC BUCKET CRANES.
ELECTRIC CHARGING MACHINES.
I-BEAM HOISTS.
ORE BRIDGES.
ROLLING MILL AND HYDRAULIC MACHINERY.
SCALE CARS AND CHARGING LARRIES.
COPPER CONVERTING MACHINERY.
STEAM HAMMERS—ALL TYPES.
HEAVY PUNCHES AND SHEARS.
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BIRMINGHAM OFFICE: BROWN-MARX BUILDING

SAND (Molding).

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Smith, J. D., Fdry. Supply Co., Cleveland, O.
Stevens, F. B., Detroit, Mich.

SAWS (Cold Metal).

Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Espen-Lucas Machine Works, Philadelphia, Pa.
Ryerson, Joseph T., & Son, Chicago, Ill.
Vandyck-Churchill Co., New York City.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

SAWS (Hot).

American Roll & Foundry Co., Canton, O.
Mesta Machine Co., Pittsburg, Pa.
Morgan Construction Co., Worcester, Mass.
Wheeling Mold & Fdy. Co., Wheeling, W. Va.

SCREWS.

American Iron & Steel Mfg. Co., Lebanon, Pa.
Milton Mfg. Co., Milton, Pa.
Republic Iron & Steel Co., Pittsburg, Pa.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Upson Nut Co., Cleveland, O.

SCREW-DRIVERS.

Billings & Spencer Co., Hartford, Conn.

SCREW STOCK.

Pittsburg Shafting Co. of Detroit, Detroit, Mich.

SEPARATORS (Magnetic).

Cutler-Hammer Clutch Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Paxson Co., J. W., Philadelphia, Pa.
Smith, J. D., Fdry. Supply Co., Cleveland, O.

SEPARATORS (Steam or Oil).

Austin Separator Co., Detroit, Mich.
Pittsburg Valve, Foundry & Construction Co., Pittsburg, Pa.
Strong, Carlisle & Hammond Co., Cleveland, O.
Wright Mfg. Co., Detroit, Mich.

SHAFTING.

American Steel & Wire Co., Chicago, Ill.
Baird Machinery Co., Pittsburg, Pa.
Bourne-Fuller Co., Cleveland, O.
Cumberland Steel Co., Cumberland, Md.
Dodge Mfg. Co., Mishawaka, Ind.
Farrel Foundry & Machine Co., Ansonia, Conn.
Globe Rolling Mill Co., Cincinnati, O.
Harvey, Arthur C., & Co., Boston, Mass.
Holliday & Co., W. J., Indianapolis, Ind.
Jones & Laughlin Steel Co., Pittsburg, Pa.
Pittsburg Shafting Co. of Detroit, Detroit.
Plamondon Mfg. Co., A., Chicago, Ill.
Republic Iron & Steel Co., Pittsburg, Pa.
Wickes Bros., Pittsburg Pa.

SHAPERS.

Baird Machinery Co., Pittsburg, Pa.
Cincinnati Shaper Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., New York.
McCabe, J. J., New York City.
Motch & Merryweather Machine Co., Cleveland, O.
Niles-Bement-Pond Co., New York City.
Vandyck-Churchill Co., New York City.
Wickes Bros. Pittsburg, Pa.

SHAPES (Agricultural).

Buffalo Steel Co., Tonawanda, N. Y.
Jones & Laughlin Steel Co., Pittsburg, Pa.
Inland Steel Co., Chicago, Ill.
Republic Iron & Steel Co. Pittsburg, Pa.

SHEARS (Billet, Bloom and Slab).

Mesta Machine Co., Pittsburg, Pa.
Morgan Construction Co., Worcester, Mass.
Wheeling Mold & Fdy. Co., Wheeling, W. Va.

SHEARS (Lever).

Mesta Machine Co., Pittsburg, Pa.
Ryerson, Joseph T., & Son, Chicago, Ill.
Wheeling Mold & Fdy Co., Wheeling, W. Va.

SHEARS (Scrap, Alligator, Wire and Wire Nail Mills).

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

SHEARS (Squaring).

Mesta Machine Co., Pittsburg, Pa.
Ryerson, Joseph T., & Son, Chicago, Ill.
Wheeling Mold & Fdy. Co., Wheeling, W. Va

SHEARS (Vertical).

Mesta Machine Co., Pittsburg, Pa.
Ryerson, Joseph T., & Son, Chicago, Ill.
Wheeling Mold & Fdy Co., Wheeling, W. Va.

SHEETS (Black Steel).

American Sheet & Tin Plate Co., Pittsburg, Pa.
Bourne-Fuller Co., Cleveland, O.
Empire Iron & Steel Co., Niles, O.
Globe Rolling Mill Co., Cincinnati, O.
Thomas Steel Co., Niles, O.

SHEETS (Corrugated).

American Sheet & Tin Plate Co., Pittsburg, Pa.
Bourne-Fuller Co., Cleveland, O.
Empire Iron & Steel Co., Niles, O.
Holliday & Co., W. J., Indianapolis, Ind.
Inland Steel Co., Chicago, Ill.
Kratzer, W. N., & Co., Pittsburg, Pa.
La Belle Iron Works, Steubenville, O.
Massillon Rolling Mill Co., Canton, O.
Mudge, Edmund W., & Co., Pittsburg, Pa.
Niles Iron & Steel Co., Niles, O.
Ryerson, Joseph T., & Son, Chicago, Ill.
Scully Steel & Iron Co., Chicago, Ill.
Seneca Iron & Steel Co., Buffalo, N. Y.
Wood, Alan, Iron & Steel Co., Philadelphia, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS (Blue Annealed).

Bourne-Fuller Co., Cleveland, O.
Portsmouth Steel Co., Portsmouth, O

SHEETS (Galvanized).

American Sheet & Tin Plate Co., Pittsburg, Pa.
Bourne-Fuller Co., Cleveland, O.
Empire Iron & Steel Co., Niles, O.
Globe Rolling Mill Co., Cincinnati, O.
Harvey, Arthur C., & Co., Boston, Mass.
Holliday & Co., W. J., Indianapolis, Ind.
Inland Steel Co., Chicago, Ill.
La Belle Iron Works, Steubenville, O.
Massillon Rolling Mill Co., Canton, O.
Mudge, Edmund W., & Co., Pittsburg, Pa.
Republic Iron & Steel Co., Pittsburg, Pa.
Ryerson, Joseph T., & Son, Chicago, Ill.
Scully Steel & Iron Co., Chicago, Ill.
Seneca Iron & Steel Co., Buffalo, N. Y.
Thomas Steel Co., Niles, O.
Wood, Alan, Iron & Steel Co., Philadelphia, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS (Iron and Steel).

American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Pittsburg, Pa.
American Tube & Stamping Co., Bridgeport, Conn.
Bourne-Fuller Co., Cleveland, O.
Buffalo Steel Co., Tonawanda, N. Y.
Disston & Sons, Inc., Henry, Philadelphia, Pa.
Empire Iron & Steel Co., Niles, O.
Globe Rolling Mill Co., Cincinnati, O.
Harvey, Arthur C., Co., Boston, Mass.
Holliday & Co., W. J., Indianapolis, Ind.
Inland Steel Co., Chicago, Ill.
Kratzer, W. N., & Co., Pittsburg, Pa.
La Belle Iron Works, Steubenville, O.
Petroleum Iron Works Co., Sharon, Pa.
Republic Iron & Steel Co., Pittsburg, Pa.
Ryerson, Joseph T., & Son, Chicago. Ill.
Scully Steel & Iron Co., Chicago, Ill.
Seneca Iron & Steel Co., Buffalo, N. Y.
Taylor, N. & G., Co., Philadelphia, Pa.
Tennessee Coal, Iron & Railroad Co., Pittsburg, Pa.
Thomas Steel Co., Niles, O.
United Steel Co., Canton, O.
Wood, Alan, Iron & Steel Co., Philadelphia, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

SHELVING (Steel).

Bernstein Mfg. Co., Philadelphia, Pa.

SHOVELS, SPADES AND SCOOPS.

Avery Stamping Co., Cleveland, O.
Obermayer, S., Co., Cincinnati. O.

SHOVELS (Electric).

Vulcan Steam Shovel Co., Toledo, O.

SHOVELS (Steam).

Bucyrus Co., South Milwaukee, Wis.
Marion Steam Shovel Co., Marion, O.
Vulcan Steam Shovel Co., Toledo, O.

SIFTERS (Sand).

Hanna Engineering Works, Chicago, Ill.
Obermayer, S., Co., Cincinnati, O.
Smith, J. D., Fdry. Supply Co., Cleveland, O.
Whiting Foundry Equipment Co., Harvey, Ill.

SLABS.

La Belle Iron Works, Steubenville, O.
Lackawanna Steel Co., New York City.
Portsmouth Steel Co., Portsmouth, O
United Steel Co., Canton, O.

SLABS (Sheet).

Inland Steel Co., Chicago, Ill.
La Belle Iron Works, Steubenville, O.
Mudge, Edmund W., & Co., Pittsburg, Pa.
Tennessee Coal, Iron & Railroad Co. Pittsburg, Pa.
United Steel Co., Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

SOAPSTONE.

Obermayer, S., Co., Cincinnati, O.
Smith, J. D., Fdry. Supply Co., Cleveland, O.
Stevens, F. B., Detroit, Mich.

SOLENOIDS.

Cutler-Hammer Clutch Co., Milwaukee, Wis.
Electric Controller & Mfg. Co., Cleveland, O.

SPECIALTIES.

National Tube Co., Pittsburg, Pa.

SPECIALTIES (Steam).

Cameron, A. S., Steam Pump Works, New York City.
Chaplin-Fulton Mfg. Co., Pittsburg, Pa.
Dean Bros. Steam Pump Works, Indianapolis, Ind.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York City.
McGowan Co., J. H., Cincinnati, O.
Pittsburg Valve, Foundry & Construction Co., Pittsburg, Pa.
Strong, Carlisle & Hammond Co., Cleveland, O.
Wright Mfg. Co., Detroit, Mich.

SPIKES.

American Iron & Steel Mfg. Co., Lebanon, Pa.
American Steel & Wire Co., Chicago, Ill.
Jones & Laughlin Steel Co., Pittsburg, Pa.
La Belle Iron Works, Steubenville, O.
Republic Iron & Steel Co., Pittsburg, Pa.

SPIKES (Screw).

Pittsburg Forge & Iron Co., Pittsburg, Pa.
Steel Car Forge Co., Pittsburg, Pa.

SPLICES (Rail).

Carnegie Steel Co., Pittsburg, Pa.
Central Track Supply Co., Springfield, O.
Jones & Laughlin Steel Co., Pittsburg, Pa.
Lackawanna Steel Co., New York City.
Republic Iron & Steel Co., Pittsburg, Pa.

STACKS.

American Bridge Co. of New York, New York City.
Canton Boiler & Engineering Co., Canton, O.
Farrar & Trefts, Buffalo, N. Y.
Meehan Boiler & Construction Co., Lowellville, O.
Petroleum Iron Works Co., Sharon, Pa.
Struthers Wells Co., Warren, Pa.
Treadwell Const. Co., Midland, Pa.

STAMPING (Sheet Metal).

American Tube & Stamping Co., Bridgeport, Conn.
Avery Stamping Co., Cleveland, O.

STAND-PIPES.

American Bridge Co., New York City.
Canton Boiler & Engineering Co., Canton, O.
Farrar & Trefts, Buffalo, N. Y.
Petroleum Iron Works Co., Sharon, Pa.
Sharon Boiler Works, Sharon, Pa.

STAPLES.

Youngstown Sheet & Tube Co., Youngstown, O.

STARTERS (Electric Motor).

Cutler-Hammer Mfg. Co., Milwaukee, Wis.
Electric Controller & Mfg. Co., Cleveland, O.

STEEL.

American Bridge Co. of New York, New York City.
Bourne-Fuller Co., Cleveland, O.
Carnegie Steel Co., Pittsburg, Pa.
Colonial Steel Co., Pittsburg, Pa.
Disston & Sons, Inc., Henry, Philadelphia, Pa.
Globe Rolling Mill Co., Cincinnati, O.
Harvey, Arthur C., Co., Boston, Mass.
Holliday & Co., W. J., Indianapolis, Ind.
Inland Steel Co., Chicago, Ill.
Interstate Iron & Steel Co., Chicago, Ill.
Jones & Laughlin Steel Co., Pittsburg, Pa.
La Belle Iron Works, Steubenville, O.
Lockhart Iron & Steel Co., Pittsburg, Pa.
Mudge, Edmund W., & Co., Pittsburg, Pa.
North Works, Chicago, Ill.
Otis Steel Co., Ltd., Cleveland, O.
Republic Iron & Steel Co., Pittsburg, Pa.
Ryerson, Joseph T., & Son, Chicago, Ill.
Scully Steel & Iron Co., Chicago. Ill.
Tennessee Coal, Iron & Railroad Co., Pittsburg, Pa.
United Steel Co., Canton, O.
Wood, Alan, Iron & Steel Co., Philadelphia, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

STEEL (Cold Rolled).

Holliday & Co., W. J., Indianapolis, Ind.
Pittsburg Shafting Co. of Detroit, Detroit, Mich.

STEEL (Crucible).

Colonial Steel Co., Pittsburg, Pa.

STEEL (Drawn).

Pittsburg Shafting Co. of Detroit, Detroit, Mich.

STEEL (Open Hearth).

Colonial Steel Co., Pittsburg, Pa.
Portsmouth Steel Co., Portsmouth, O

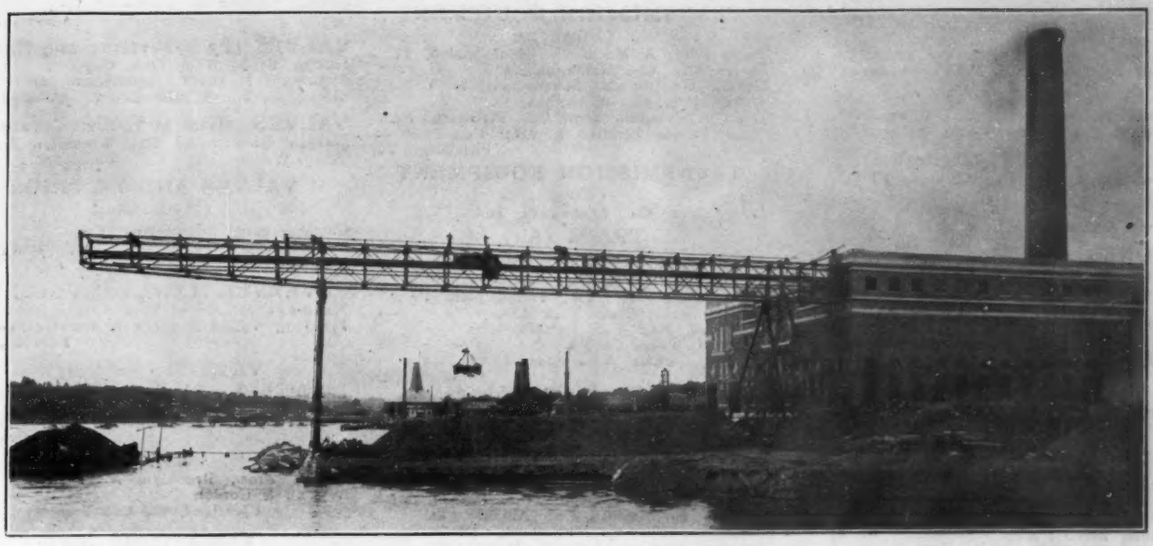
STEEL (Pressed).

Heggie-Woodruff Pressed Steel Co., Joliet, Ill.

STEEL (Structural).

American Bridge Co. of New York, New York City.
Bellefontaine Bridge & Steel Co., Bellefontaine, O.
Bourne-Fuller Co., Cleveland, O.
Buffalo Steel Co., Tonawanda, N. Y.
Carnegie Steel Co., Pittsburg, Pa.
Empire Iron & Steel Co., Niles, O.
Globe Rolling Mill Co., Cincinnati, O.
Holliday & Co., W. J., Indianapolis, Ind.
Inland Steel Co., Chicago, Ill.
Interstate Engineering Co., Bedford, O.
Interstate Iron & Steel Co., Chicago, Ill.
Jones & Laughlin Steel Co., Pittsburg, Pa.
Kratzer, W. N., & Co., Pittsburg Pa.
Lackawanna Steel Co., New York City.
McClintic-Marshall Constr. Co., Pittsburg, Pa.
Mudge, Edmund W., & Co., Pittsburg, Pa.
North Works, Chicago, Ill.
Republic Iron & Steel Co., Pittsburg, Pa.
Ryerson, Joseph T., & Son, Chicago, Ill.
Scaife, Wm. B., & Sons Co., Pittsburg, Pa.
Scully Steel & Iron Co., Chicago. Ill.
Variety Iron & Steel Works Co., Cleveland, O.

MORGAN COAL HANDLING GANTRY CRANE



AT THE WESTPORT POWER STATION OF THE CONSOLIDATED GAS, ELECTRIC LIGHT & POWER CO., BALTIMORE, MD.
Span, 183 ft.; Cantilever extension on water end, 80 ft.; Building end, 30 ft., 6 in.; height runway rail to trolley rail, 71 ft., 4¼ in.
The trolley operates a three cubic yard clam shell bucket.

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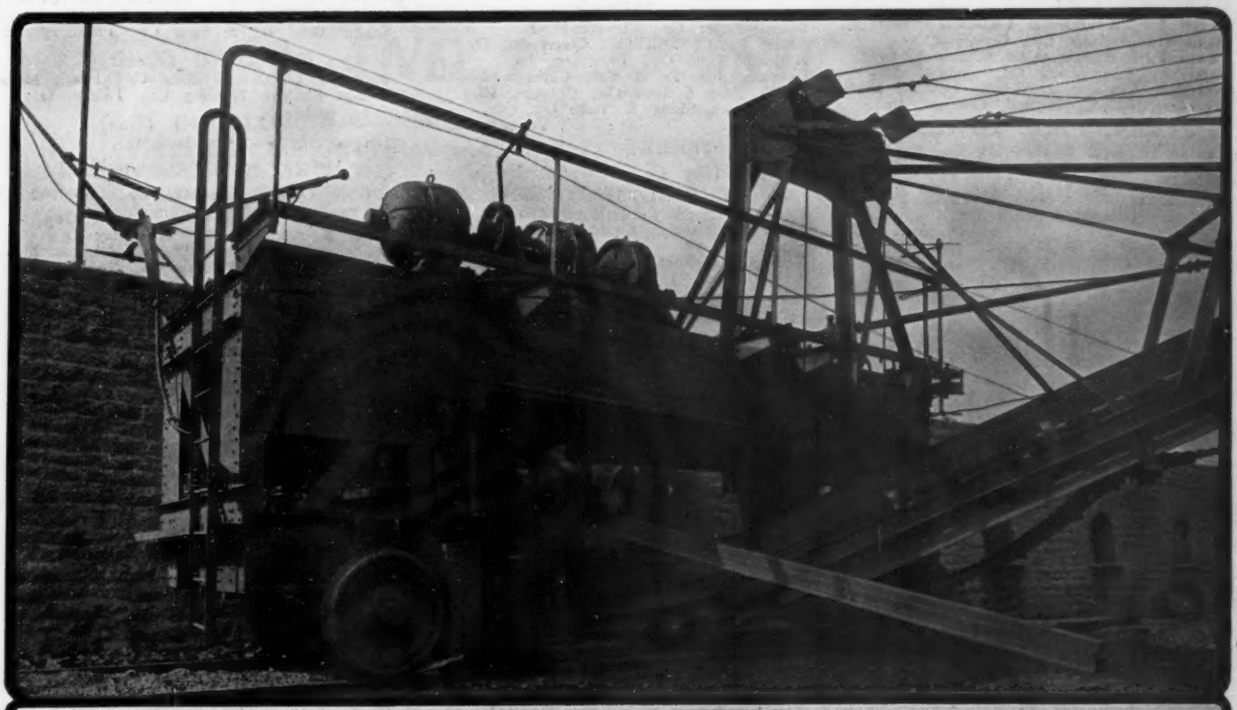

Our Patented Coke Drawing and Loading Machine for Bee Hive Ovens

The Variety Iron & Steel Works Co.

Hamilton and East 40th Streets CLEVELAND, OHIO

STEEL (Tool).
Bourne-Fuller Co., Cleveland, O.
Colonial Steel Co., Pittsburg, Pa.
Disston & Sons, Inc., Henry, Philadelphia, Pa.
Firth-Sterling Steel Co., McKeesport, Pa.
Globe Rolling Mill Co., Cincinnati, O.
Harvey, Arthur C., Co., Boston, Mass.
Ryerson, Joseph T., & Son, Chicago, Ill.
Scully Steel & Iron Co., Chicago, Ill.

STOCKS (Die).
Bignall & Keeler Mfg. Co., Edwardsville, Ill.
Standard Engineering Works, Ellwood City, Pa.

STOKERS (Mechanical).
Green Engineering Co., Chicago, Ill.

STONES (Oil).
Norton Co., Worcester, Mass.

STONES (Rubbing and Sharpening).
Norton Co., Worcester, Mass.

STRIP STEEL.
Pittsburg Shafting Co. of Detroit, Detroit.

SUPPLIES (Pattern Makers').
Cleveland Galvanizing Works Co., Cleveland.

SWITCHBOARDS.
General Electric Co., Schenectady, N. Y.

SWITCHES.
Central Track Supply Co., Springfield, O.

SWITCHES (Electrical).
Cutler-Hammer Mfg. Co., Milwaukee, Wis.
Electric Controller & Mfg. Co., Cleveland, O.
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., Pittsburg, Pa.

SWITCHES (Magnetic).
Cutler-Hammer Mfg. Co., Milwaukee, Wis.
Electric Controller & Mfg. Co., Cleveland, O.

SWITCHES (Solenoid).
Cutler-Hammer Mfg. Co., Milwaukee, Wis.

SWITCHES (Snap).
Cutler-Hammer Mfg. Co., Milwaukee, Wis.

TABLES (Drawing).
Economy Drawing Table Co., Toledo, O.

TABLES (Rolling Mill).
Morgan Construction Co., Worcester, Mass.

TABLES (Turn).
Atlas Car & Mfg. Co., Cleveland, O.
Chase Fdy. & Mfg. Co., Columbus, O.
Interstate Engineering Co., Bedford, O.
Northern Engineering Works, Detroit, Mich.
Ryerson, Jos. T., & Son, Chicago, Ill.

TANKS AND TOWERS.
Canton Boiler & Engineering Co., Canton, O.
Farrar & Trefts, Buffalo, N. Y.
Heggie, Jas. G., Joliet, Ill.
Kratzer, W. N., & Co., Pittsburg, Pa.
Meehan Boiler & Construction Co., Lowellville, O.
Newbold, R. S., & Son Co., Norristown, Pa.
Petroleum Iron Works Co., Sharon, Pa.
Riter-Conley Mfg. Co., Pittsburg, Pa.
Scaife, Wm. B., & Sons Co., Pittsburg, Pa.
Sharon Boiler Works, Sharon, Pa.
Struthers-Wells Co., Warren, Pa.
Treadwell Const. Co., Midland, Pa.
Variety Iron & Steel Works Co., Cleveland, O.

TANKS (Water and Acid Storage, Wire Mills).
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

TOOLS (Molders').
Obermayer, S., Co., Cincinnati, O.

TOOLS (Pneumatic).
Independent Pneumatic Tool Co., Chicago, Ill.
Ryerson, Jos. T., & Son, Chicago, Ill.
Scully Steel & Iron Co., Chicago, Ill.

TOOLS (Thread Cutting).
Bignall & Keeler Mfg Co., Edwardsville, Ill.
Williams Tool Co., Erie, Pa.

TORCHES (Shop).
Dayton Malleable Iron Co., Dayton, O.
Obermayer, S., Co., Cincinnati, O.

TRACK (Industrial).
Atlas Car & Mfg. Co., Cleveland, O.
Chase Foundry & Mfg. Co., Columbus, O.
Central Track & Supply Co., Springfield, O.
Northern Engineering Works, Detroit, Mich.
Wiener Co., Ernst, New York, N. Y.
Whiting Foundry Equipment Co., Harvey, Ill.

TRACK (Overhead).
Brown Hoisting Machinery Co., Cleveland, O.

TRAMRAILS (Overhead Systems).
Brown Hoisting Machinery Co., Cleveland, O.
Northern Engineering Works, Detroit, Mich.
Whiting Foundry Equipment Co., Harvey, Ill.

TRANSMISSION EQUIPMENT (Power).
Bond Fdry. & Mach. Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Jones & Laughlin Steel Co., Pittsburg, Pa.
Westinghouse Electric & Mfg. Co., Pittsburg, Pa.

TRANSMISSION EQUIPMENT (Rope).
Dodge Mfg. Co., Mishawaka, Ind.

TRAPS (Air).
Wright Mfg. Co., Detroit, Mich.

TRAPS (Steam).
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York City.
Morehead Mfg. Co., Detroit, Mich.
National Tube Co., Pittsburg, Pa.
Strong, Carlisle & Hammond Co., Cleveland, O.
Wright Mfg. Co., Detroit, Mich.

TROLLEYS.
Browning, Victor R., Co., Cleveland, O.
Chisholm & Moore Mfg. Co., Cleveland, O.
Cleveland Crane & Engrg. Co., Wickliffe, O.
Curtis & Co. Mfg. Co., St. Louis, Mo.
Detroit Hoist & Machine Co., Detroit, Mich.
Morgan Engineering Co., Alliance, O.
National Tube Co., Pittsburg, Pa.
Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.
Smith, J D., Fdry. Supply Co., Cleveland, O.

TRUCKS.
Jones & Laughlin Equipment Co., Harvey, Ill.
Wellman-Seaver-Morgan Co., Cleveland, O.

TRUCKS (Electrically Driven).
Westinghouse Storage Battery Co., Boonton, N. J.

TRUCKS (Storage Battery).
Westinghouse Storage Battery Co., Boonton, N. J.

TRUCKS (Wire Rod, Wire Mills).
Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

TUBES.
Bourne-Fuller Co., Cleveland, O.
Globe Rolling Mill Co., Cincinnati, O.
National Tube Co., Pittsburg, Pa.
Ryerson, Jos. T., & Son, Chicago, Ill.
Scully Steel & Iron Co., Chicago, Ill.
Youngstown Sheet & Tube Co., Youngstown, O.

TUBES (Boiler).
National Tube Co., Pittsburg, Pa.

TUBING (Automobile).
National Tube Co., Pittsburg, Pa.
Pittsburg Shafting Co. of Detroit, Detroit, Mich.
Youngstown Sheet & Tube Co., Youngstown, O.

TUBING (Seamless Steel).
Ivins, Ellwood, Tube Works, Philadelphia, Pa.
National Tube Co., Pittsburg, Pa.
Pittsburg Shafting Co. of Detroit, Detroit, Mich.

TUBING (Tool Steel).
Ivins, Ellwood, Tube Works, Philadelphia, Pa.

TUMBLING MILLS.
Sly Mfg. Co., W. W., Cleveland, O.

TURBINES (Steam).
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., Pittsburg, Pa.

TURNBUCKLES.
American Iron & Steel Mfg. Co., Lebanon, Pa.
Cleveland City Forge & Iron Co., Cleveland, O.
Globe Rolling Mill Co., Cincinnati, O.
Graham Nut Co., Pittsburg, Pa.
Jones & Laughlin Steel Co., Pittsburg, Pa.
Merrill Bros., Brooklyn, N. Y.
Milton Mfg. Co., Milton, Pa.
Republic Iron & Steel Co., Pittsburg, Pa.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Steel Car Forge Co., Pittsburg, Pa.
Upson Nut Co., Cleveland, O.

VALVES.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York City.
McGowan, J. H., Co., Cincinnati, O.
Treadwell Const. Co., Midland, Pa.
Pittsburg Piping & Equipment Co., Pittsburg, Pa.
Pittsburg Valve, Foundry & Construction Co., Pittsburg, Pa.
Strong, Carlisle & Hammond Co., Cleveland, O.

VALVES (Back Pressure and Check).
Jenkins Bros., New York City.
McGowan, J. H., Co., Cincinnati, O.
Strong, Carlisle & Hammond Co., Cleveland, O.

VALVES (Gas and Air Reversing).
Morgan Construction Co., Worcester, Mass.
Taylor-Wilson Mfg. Co., Philadelphia, Pa.

VALVES AND FITTINGS. (Hydraulic.)
Chambersburg Engineering Co., Chambersburg, Pa.
National Tube Co., Pittsburg, Pa.

VALVES (Lever and Throttle).
Jenkins Bros., New York City.
Pittsburg Valve, Foundry & Construction Co., Pittsburg, Pa.

VALVES (Reducing).
Jenkins Bros., New York City.
McGowan, J. H., Co., Cincinnati, O.
Strong, Carlisle & Hammond Co., Cleveland, O.

VISES.
Merrill Bros., Brooklyn, N. Y.
Wyman & Gordon Co., Cleveland, O., and Worcester, Mass.

VISES (Solid Jaw).
Hollands Mfg. Co., Erie, Pa.

VISES (Swivel Jaw).
Hollands Mfg. Co., Erie, Pa.

WAGON HARDWARE.
Oliver Iron & Steel Co., Pittsburg, Pa.

WASHERS.
American Iron & Steel Mfg. Co., Lebanon, Pa.
Graham Nut Co., Pittsburg, Pa.
Milton Mfg Co., Milton, Pa.
National Bolt & Nut Co., Pittsburg, Pa.
Oliver Iron & Steel Co., Pittsburg, Pa.
Steel Car Forge Co., Pittsburg, Pa.
Upson Nut Co., Cleveland, O.
Wrought Washer Mfg. Co., Milwaukee, Wis.

WATER SOFTENING PLANTS.
Dodge Mfg. Co., Mishawaka, Ind.
Scaife, Wm. B., & Sons Co., Pittsburg, Pa.

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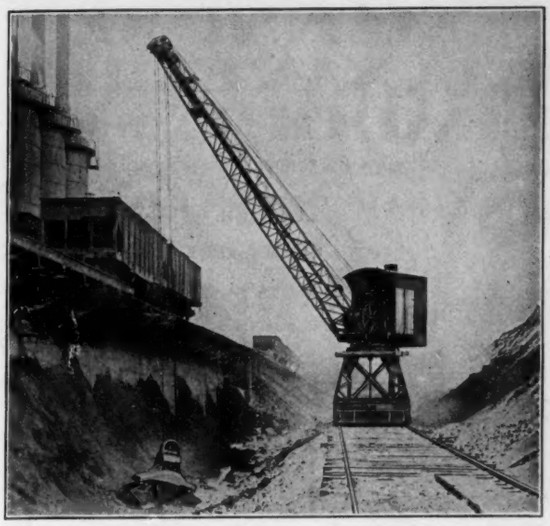

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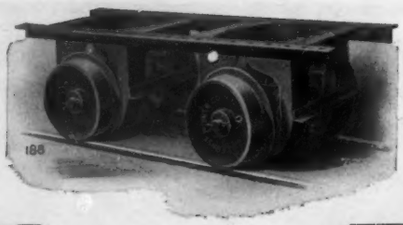

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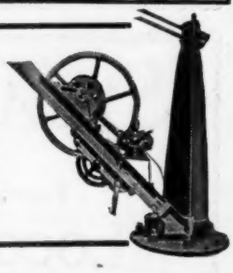

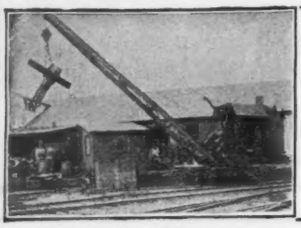

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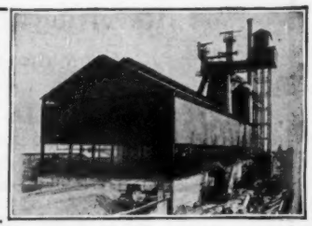

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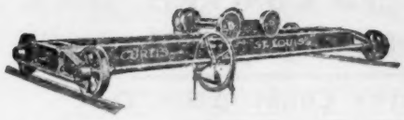

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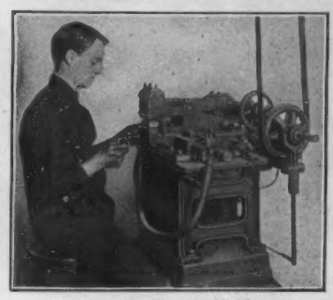

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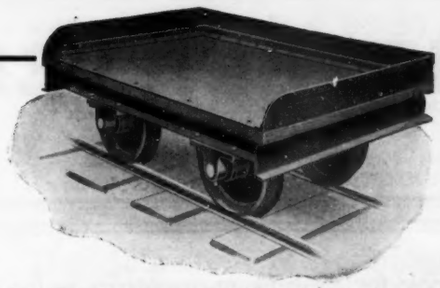

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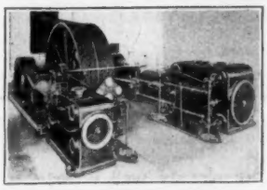

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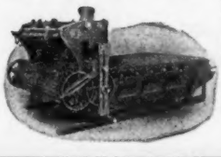

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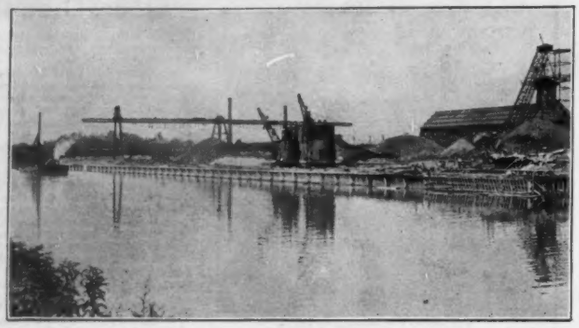

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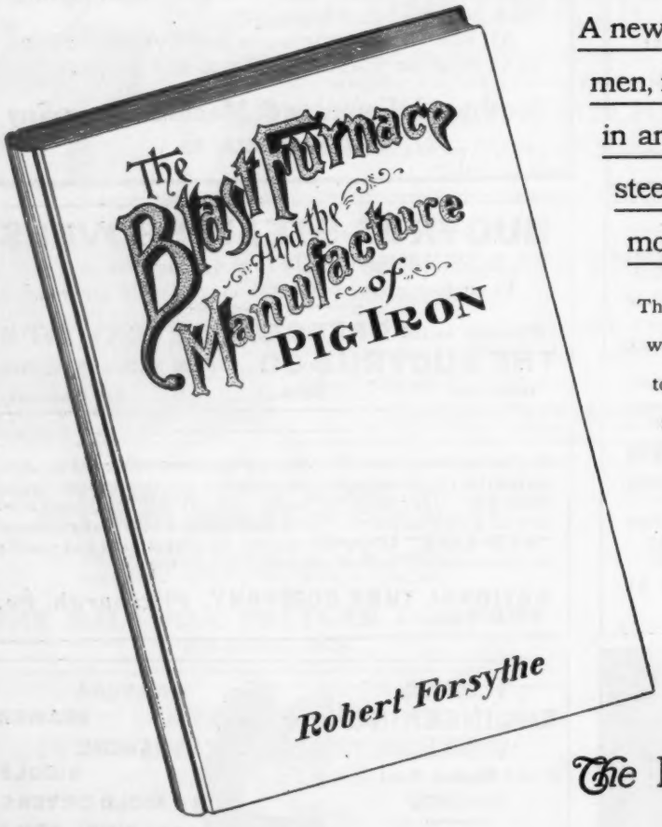

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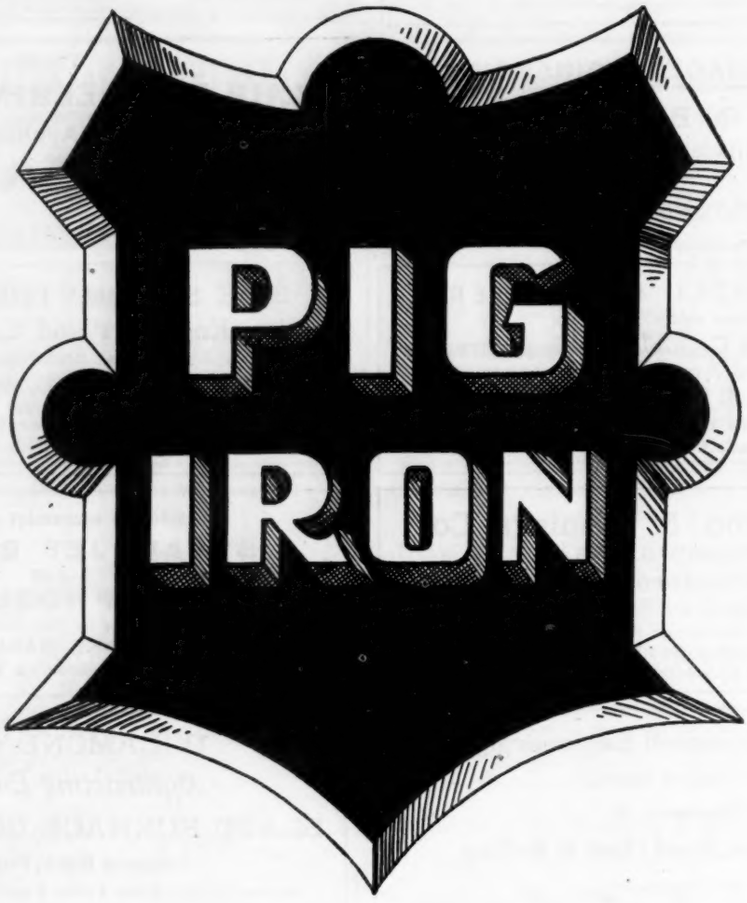

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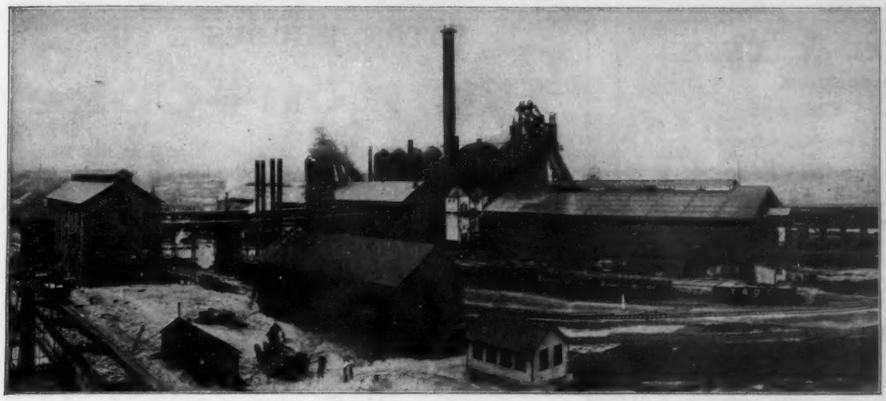

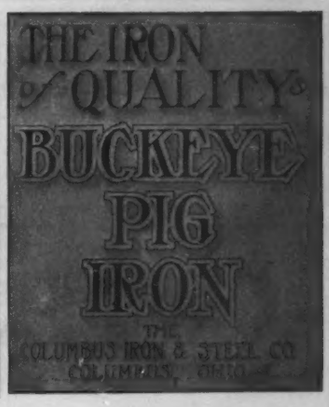

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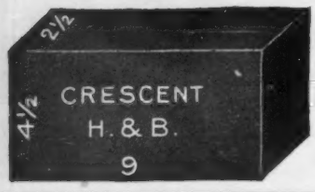

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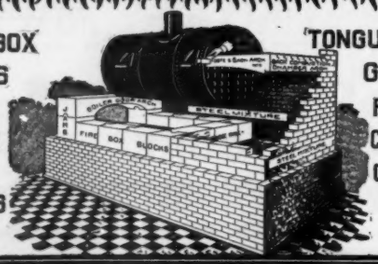

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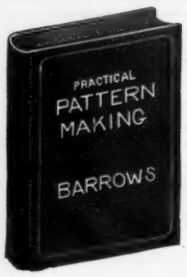

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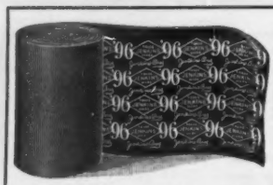

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¶ The iron boiler tube is being rapidly replaced in general service by the MODERN BOILER TUBE—the STEEL tube. Read the eighth of the series "Testimony From the Actual Users" on pages 12-13 of this issue.

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¶ The eighth of the series "Testimony From the Actual Users" on pages 12-13 of this issue, is particularly interesting, containing as it does information obtained from a practical knowledge, extending over a number of years, of the MODERN BOILER TUBE—the STEEL tube.

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The DUREX Brand.

▲ This brand is a very dense, refractory and hard brick.

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22″ x 24″ x 24″ Ingersoll-Sargeant, steam.

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14″ x 22″ Rand, Class E, straight line, belt driven, cap. 392 ft., free air.

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12″ x 10″ Bury, motor driven, cap. 194 ft., free air.

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DRAFTSMAN WANTED. SEVERAL first class and experienced open hearth furnace and rolling mill draftsmen at large steel plant near Pittsburg. State experience and salary expected. Address Box 580, THE IRON TRADE REVIEW, Cleveland, O. I.T.R.

MECHANICAL AND ELECTRICAL foreman wanted, experienced in electric and steam power, heat, light and general millwright work, capable of having complete charge of power plant and all machinery with a large manufacturing company. Address Box 581, THE IRON TRADE REVIEW, Cleveland, O. I.T.R.

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SUPERINTENDENT WANTED FOR malleable iron foundry employing up to 200 molders on railroad and miscellaneous malleable castings, to take entire charge of plant from unloading raw material to shipment of product. None but those familiar with modern, up-to-date malleable foundry practice and capable of getting out a maximum production need apply. Address Box 739, THE FOUNDRY, Cleveland, O.

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AS SUPERINTENDENT OR GENERAL manager of manufacturing plant. Thoroughly experienced and acquainted in every modern detail of gray iron castings, machine and wood work, from securing business to shipment of finished product. Am practical in all lines and have held present position as superintendent and general manager for ten years, but desire change. Highest references. Address Box 574, THE IRON TRADE REVIEW, Cleveland, O. I.T.R.

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A GENERAL ALL-AROUND MALLEable iron man of 20 years experience desires a change Jan. 1. Thoroughly understands the mixtures of iron, melting and annealing and am a hustler and can produce best results. Am 36 years of age and married and can furnish A1 references. Any reasonable offer considered. Address "A. A.," care PENTON'S LIST, Cleveland, O. p.

BY FOUNDRY FOREMAN, PRACTICAL and up-to-date, in all classes of work, twenty-one years of practical experience. Can handle men to good advantage, can give good references. Would prefer jobbing and machinery work. Address Box 120, PENTON'S LIST, Cleveland, O. p.

AS FOREMAN PATTERN MAKER. First class, practical, up-to-date methods, experienced all class work, green sand, loam and molding machines. Satisfaction guaranteed. First class references, sober, reliable, fair draughtsman and good estimator, practical molder, 23 years' experience, 12 foreman pattern shop, 4 superintendent of foundry and pattern shop. Address Box 121, PENTON'S LIST, Cleveland, O. p.

POSITION WANTED AS BLACKSMITH foreman. Thorough knowledge of heavy forging and machine blacksmithing, dredge, dipper, engine and rail mill specialty. American, age 38, married, capable of doing things and handling men. Have been foreman for ten years and have good references. Address Box 122, PENTON'S LIST, Cleveland, Ohio. p.

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EXPERIENCED FOUNDRY MANAGER wanted who knows the gray iron business and is willing to invest some money in a small modern foundry having a 7-ton cupola, electric crane, etc. Applicants must be prepared to assume the entire management, including the sale of the foundry department product of an iron and steel business. Address Box 578, THE IRON TRADE REVIEW, Cleveland, O. I.T.R.

MACHINE SHOP FOR SALE, MAKING a specialty of mine cars, wheelbarrows, furnace buggies and job work. Has a regular line. Good trade and prospects. Proprietor is growing old. Fine chance for a hustler. Address James O'Donnell, 164 Dearborn St., Chicago, Ill. I.T.R.

A WELL ESTABLISHED BOILER AND tank business for sale, of over 40 years standing, located in the city of Detroit, Mich., including good will of business and entire equipment of plant, consisting of boiler, feed water heater, engine, air pump, drills, punches, shears, rolls and complete line of air riveters, calkers and drills, blacksmiths and flange fire forges with former castings and accompanying tools and large assortment of small shop tools, reamers, taps, expanders, chisels, hammers, etc. Also a large stock of boiler and tank plate, flanged heads, sheet steel boiler tubes and rivets. Delivery during March and must be cleared away to allow railroad improvement work over property. For full particulars apply Stephen Pratt Boiler Works, Detroit, Mich. I.T.R.

FOR SALE OR RENT: FACTORY BUILDing, built for foundry and machine shop. Can be easily remodeled for other business. Railroad facilities unexcelled. For further information, address the Franklin Industrial Co., Warwick, O. I.T.R.

AS CORRESPONDENT, FIVE YEAR'S experience in malleable and gray iron, familiar with all details in connection with foundry practice. Age 32. Best of references. Address Box 586, THE IRON TRADE REVIEW, Cleveland, O. I.T.R.

MANUFACTURING INVESTMENT OPportunity. Good young, going Steel Plate Construction Concern wants additional capital for development. Has fully equipped, new modern plant, well established organization, plenty of good business, admirably located in Eastern Ohio. An excellent opportunity for good capital. Write promptly. P. O. Box No. 473, Canton, O. I.T.R.

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ONE 800 LB. BEMENT-MILES STEAM hammer for sale, in very fine condition. Can be seen in operation. Address John Obenberger Co., Milwaukee, Wis. I.T.R.

7 SECOND HAND SPEED LATHES FOR sale, 32 inch centers, 7 inch swing, complete with countershafts. Good bargain. Address Post Office Box No. 212, Chicago, Ill. p.

ONE ROPE DRIVE WHEEL FOR SALE, as follows: Outside diameter from base of grooves, 11 ft. 4 in., face of wheel overall, 19 in., 8 grooves, 1½ in. rope, depth of groove, 1-9/16 in., outside grooves, 2¼ in. deep, length of hub, 16½ in., bored, 8 in., K. S. 11/16 in. x 2 in., 8 arms, wheel split with bolts for bolting together, weight complete, 7,500 pounds. Address United Iron Works Co., Springfield, Mo. p.

ELECTRIC TRAVELING CRANE WANTed, 30 ft. span. 10 to 20 tons capacity. Address Box 582, THE IRON TRADE REVIEW, Cleveland, O. I.T.R.

SECOND HAND PUNCH WANTED, double end with 24 in. to 30 in. gap. Capacity 1" hole through ¾" plate. Address Box 583, THE IRON TRADE REVIEW, Cleveland, O. I.T.R.

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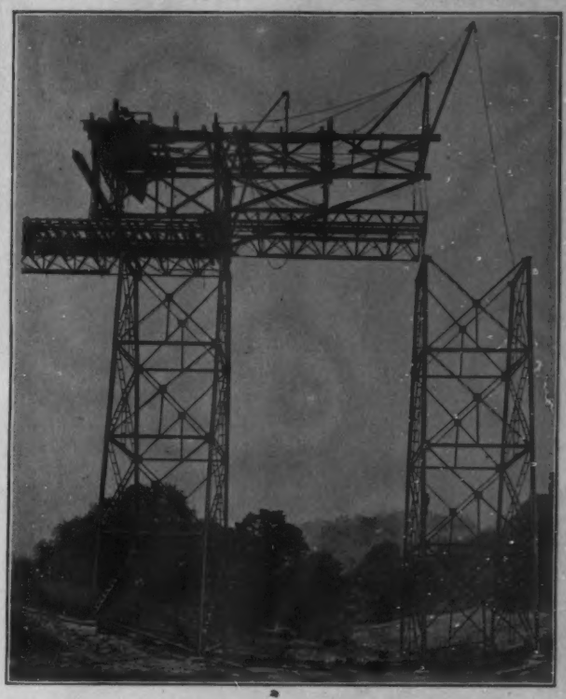

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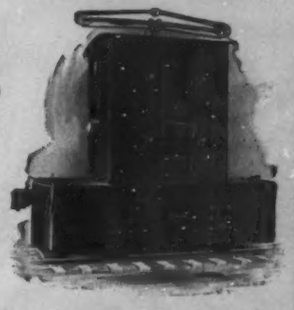

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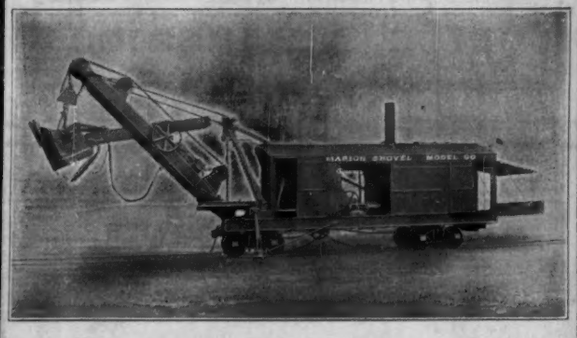

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